FINAL REPORT NUMBER: SINCAP-TRC-13-003

NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST

Chrysler Group LLC
2013 Jeep Patriot Sport FWD
NHTSA NUMBER: MD0312

PREPARED BY:
Transportation Research Center Inc.
10820 State Route 347
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East Liberty, OH 43319

Report Date: January 11, 2013

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE, Room W43-410
Washington, D.C. 20590

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Prepared By: ILO Project Operations Team

Approved By: 

Approval Date: January 11, 2013

FINAL REPORT ACCEPTANCE BY OCWS:

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date:_____

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date:_____

Technical Report Documentation Page

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9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No. 11. Contract or Grant No. DTNH22-09-D-00125
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15. Supplemental Notes

16. Abstract

This 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2013 Jeep Patriot Sport FWD MPV in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on October 16, 2012.

The impact velocity of the Moving Deformable Barrier (MDB) was 61.65 km/h, and the ambient temperature at the struck (left) side of the target vehicle at the time of impact was 22° C. The target vehicle post-test maximum crush was 179 mm at Level 3. The test vehicle's performance was as follows:

Driver ATD (ES-2re)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	NA	1000	74
Maximum Thoracic Rib Deflection	mm	44	6.1
Total Abdominal Force	N	2500	888.9
Pubic Symphysis Force	N	6000	1804.6

Passenger ATD (SID-IIs)

Measurement Description	Units	IARV	Result
Head Injury Criteria (HIC_{36})	NA	1000	254
Resultant Lower Spine Acceleration	g's	82	63.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3942.0
Maximum Thoracic Rib Deflection	mm	38*	33.4
Maximum Abdominal Rib Deflection	mm	45*	30.1

* Proposed IARV

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

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SECTION 1
TEST PURPOSE AND PROCEDURE

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test was conducted as part of the MY 2013 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00125. The purpose of this test is to generate comparative side impact performance in a 2013 Jeep Patriot Sport FWD MPV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A 2013 Jeep Patriot Sport FWD MPV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.65 km/h (38.31 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Transportation Research Center Inc. in East Liberty, OH, on October 16, 2012. Pre-test and post-test photographs of the test vehicle and the MDB and the dummies (ES-2-re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated August 2011. The side impact event was documented by 10 cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen forward, middle, and rear y-axis load cells
Lower spine (T12) tri-axial accelerometers
Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)
Primary and redundant head CG triaxial accelerometers
Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
Abdomen upper rib and lower rib y-axis displacement potentiometers
Lower spine (T12) tri-axial accelerometers
Acetabulum and iliac wing y-axis load cells

APPENDIX B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in APPENDIX C of this report.

Dummy injury readings were recorded as follows:

Measurement Description	Driver ATD (ES-2-re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	NA	1000	74
Maximum Thoracic Rib Deflection	mm	44	6.1
Combined Abdominal Force	N	2500	888.9
Pubic Symphysis Force	N	6000	1804.6

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})	NA	1000	254
Lower Spine (T12) Resultant Acceleration	G	82	63.2
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3942.0
Maximum Thoracic Rib Deflection	mm	38*	33.4
Maximum Abdominal Rib Deflection	mm	45*	30.1

* Proposed IARV

Supplemental Restraint Information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	NA
Seat Belt Load Limiter	Yes	No	NA	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS

Door unlatched: No
Fuel spillage: No
Airbag deployment notes: NA
Injury values exceeded thresholds: NA

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312

Test Program: NCAP Side Impact Test Date: 10/16/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MD0312	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	No
Make	Jeep	Automatic Door Locks (ADL)	Yes
Model	Patriot Sport	Power Window Auto-Reverse	Yes
Body Style	MPV	Other Optional Feature	NA
VIN	1C4NJPBA2DD122181	Driver Frontal Airbag	Yes
Body Color	Gray	Driver Curtain Airbag	Yes
Odometer Reading (miles)	3.22 / 2 (km/mi)	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.0	Driver Torso Airbag	No
Number of Cylinders	4	Driver Torso/Pelvis Airbag	No
Engine Placement	Transverse	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	CVT	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front Wheel Drive	Rear Pass. Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	No
Sunroof / T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	No	Driver Load Limiter	No
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	NA

Does owner's manual provide instructions to turn off automatic door locks? Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC	GVWR (kg)	2012
Date of Manufacture	9/12	GAWR Front (kg)	1080
Vehicle Type	MPV	GAWR Rear (kg)	1044

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

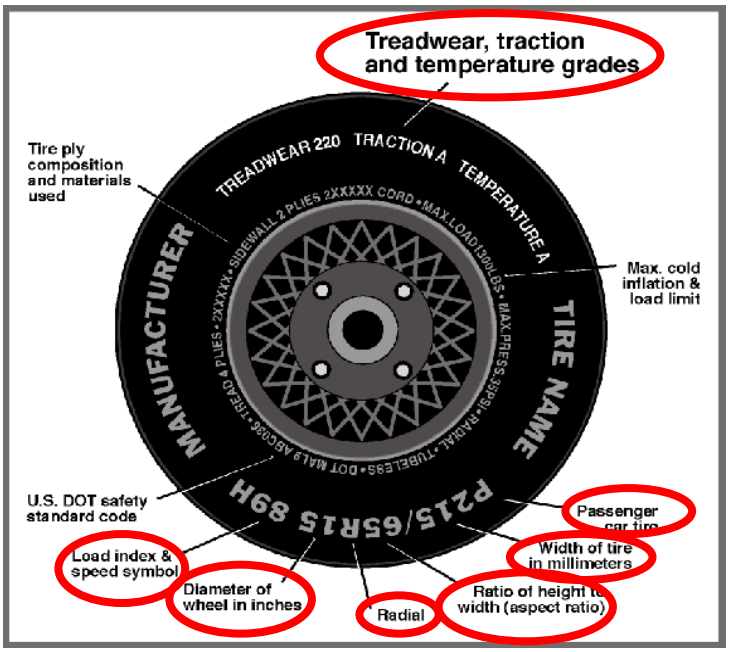
Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				419.0	(A)
DSC x 68.08 (kg)				340.4	(B)
Cargo Weight (RCLW) (kg)				78.6	(A-B)

VEHICLE SEAT TYPE

	Type of Seat Pan				Type of Seat Back		
Seating Location	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes	No	No		No	Yes	No
Rear or Second Row Seat	No	No	Yes	No	Yes	No	No
Third Row Seat	NA	NA	NA	NA	NA	NA	NA

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P205/70R16	P205/70R16
Tire Size on Vehicle	P205/70R16	P205/70R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle LS2	Eagle LS2
Treadwear	400	400
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	2	2
Load Index/Speed Symbol	96T	96T
Tire Material	Polyester & Steel	Polyester & Steel
DOT Safety Code Left	M60W CUER 3212	M60W CUER 3212
DOT Safety Code Right	M60W CUER 3212	M60W CUER 3212

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	240	240
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	241	241	241	241

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 +/- 21	193	193	193	193

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	431.8	311.2		468.6	367.2		473.2	404.0	
Right	kg	410.4	283.8		442.8	354.8		417.4	357.4	
Ratio	%	58.6	41.4		55.8	44.2		53.9	46.1	
Totals	kg	842.2	595.0	1437.2	911.4	722.0	1633.4	890.6	761.4	1652.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1437.2	(A)
Actual Weight of 2 P572 ATDs Used	kg	125.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	78.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1641.0	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? X YES □ NO

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast 4.7 kg of steel plate mounted in the rear cargo area	4.7

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	776	775	Yes
RF	mm	786	782	Yes
RR	mm	768	788	No
LR	mm	780	777	Yes
Vehicle CG (Aft of Front Axle)	mm	1217	1167	No
Vehicle CG (Left(+)/Right (-) from Longitudinal centerline	mm	42	16	

***The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirement".

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

SEAT POSITIONING

The driver seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	13.7	13.7	13.7
Front Passenger Seat	14.1	14.1	14.1
Front Center Seat*	NA	NA	NA
Struck Side Rear Seat	NA	NA	NA
Non-Struck Side Rear Seat	NA	NA	NA
Rear Center Seat*	NA	NA	NA

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	13.7	Fixed	Max.	NA	NA	NA
			Mid	13.7	13.7	13.7
			Min.	NA	NA	NA
Front Passenger Seat	14.1	Fixed	Max.	NA	NA	NA
			Mid	14.1	14.1	14.1
			Min.	NA	NA	NA
Front Center Seat*	NA	NA	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA
Struck Side Rear Seat	9.2	Fixed	Max.	NA	NA	NA
			Mid	9.2	9.2	9.2
			Min.	NA	NA	NA
Non-Struck Side Rear Seat	9.2	Fixed	Max.	NA	NA	NA
			Mid	9.2	9.2	9.2
			Min.	NA	NA	NA
Rear Center Seat*	NA	Fixed	Max.	NA	NA	NA
			Mid	NA	NA	NA
			Min.	NA	NA	NA

* If applicable.

DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

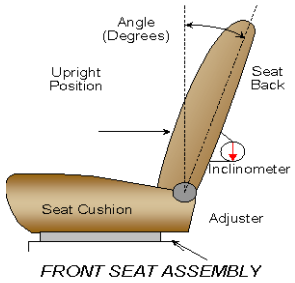
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	265	39	132	20
Front Passenger Seat	265	39	132	20
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat	0	NA	NA	NA
Non-Struck Side Rear Seat	0	NA	NA	NA
Rear Center Seat*	0	NA	NA	NA

* If applicable.

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated seat back angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	78.2	39	12.7	8
Front Passenger Seat	76.9	39	12.7	8
Front Center Seat*	NA	NA	NA	NA
Struck Side Rear Seat w/ Seated Dummy	Fixed	NA	NA	NA
Non-Struck Side Rear Seat	Fixed	NA	NA	NA
Rear Center Seat*	Fixed	NA	NA	NA

* If applicable.

DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted with the information provided by the manufacturer on Form No. 1

	Total # of Positions	Placed in Position #
Driver Seat	4	1
Rear Seat	Fixed	NA

HEAD RESTRAINT ADJUSTMENT

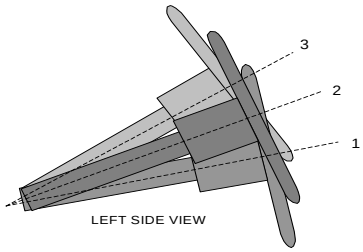
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	1
Rear Seat	Fixed	NA

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric locus it describes when it moves through its full range of motion.

	Degrees	Fore/Aft Position, mm
Lowermost, Position 1	68.9	NA
Geometric Center, Position 2	65.7	NA
Uppermost, Position 3	62.5	NA
Telescoping Steering Wheel Travel		NA
Test Position	65.8	NA

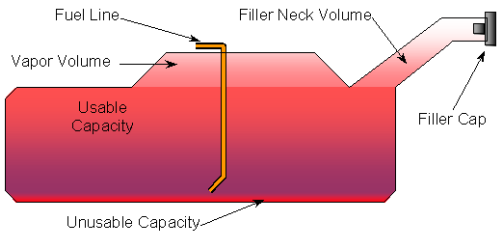


STEERING COLUMN ASSEMBLY

FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler neck:

The fuel tank is located in front of the rear axle under the rear seat area. The fuel filler neck enters the left rear corner of the fuel tank. The fuel filler cap is located on the left rear quarter panel. The fuel lines run inside of the left frame rail.



VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

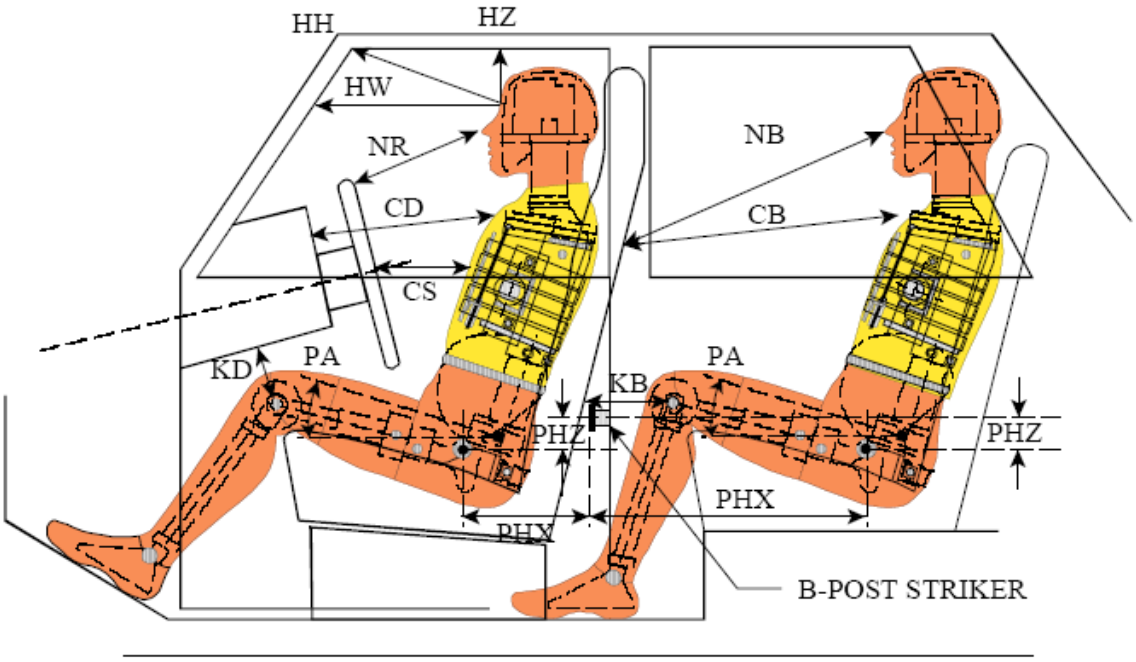
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	51.5
Usable Capacity of "Optional" Tank (see Form No. 1)	NA
Usable Capacity of Standard Tank (see Owner's Manual)	51.5
Usable Capacity of Optional Tank (see Owner's Manual)	NA
93% of Usable Capacity	47.7
Actual Amount of Solvent Used in Test	47.7
1/3 of Usable Capacity	17.2

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated on Form No. 1? X YES □ NO

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

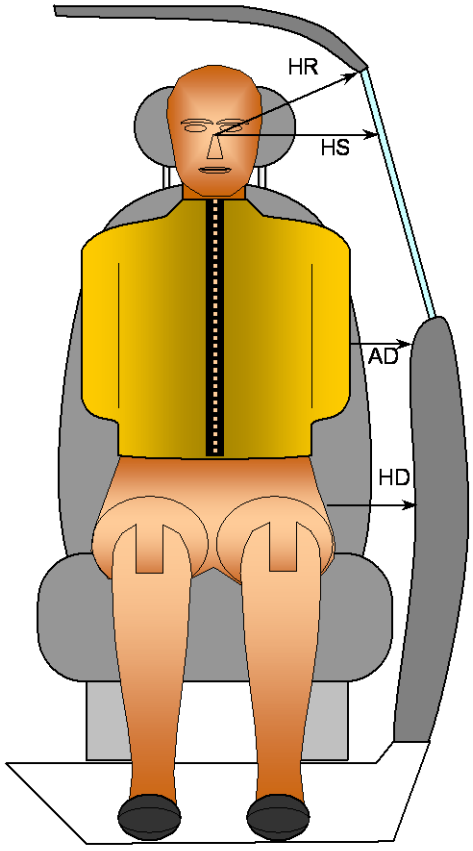
LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	205			
HW		Head to Windshield	783			
HZ	HZ	Head to Roof Liner	643		345	
NR	NB	Nose to Rim/Seat Back	450		530	
CD	CB	Chest to Dash/Seat Back	565		533	
CS		Chest to Steering Wheel	281			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	142	28	311	5.7
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	130	280	309	3.6
PAX°	PAX°	Pelvic Tilt Angle X				16.4
	PHY°	Pelvic Tilt Angle Y				0.0
PHX	PHX	Hip Point to Striker (X-Axis)	212		144	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	115		308	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

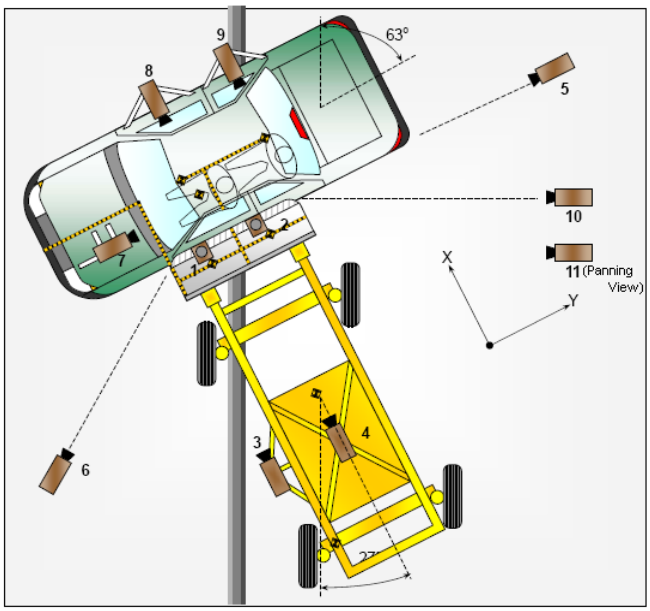


FRONT VIEW OF DUMMY

Code	Description	Units	Driver	Passenger
HR	Head to Side Header	mm	189	295
HS	Head to Side Window	mm	364	394
AD	Arm to Door	mm	73	101
HD	H-Point to Door	mm	144	160

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-305	1063	-5745	8.5	30
2	Overhead Close-up	-610	710	-5749	25	1000
3	Left Impact Point (MDB)	1783	-856	-823	16	1000
4	Side Overall (MDB)	2489	0	-1443	8.5	1000
5	Rear	0	8103	-1325	12.5	1000
6	Left Front	1659	-3894	-1256	16	1000
7	Driver Front (OB)				12.5	1000
8	Driver Side (OB)				8.5	1000
9	Passenger Side (OB)				8.5	1000
10	Real-time Left Rear				zoom	30
11	Real-time Inrun				zoom	30

Reference: Impact Point projected to Ground; +X = To Front of MDB +Y = To Right of MDB; +Z = Down

*All measurements accurate to ± 6 mm.

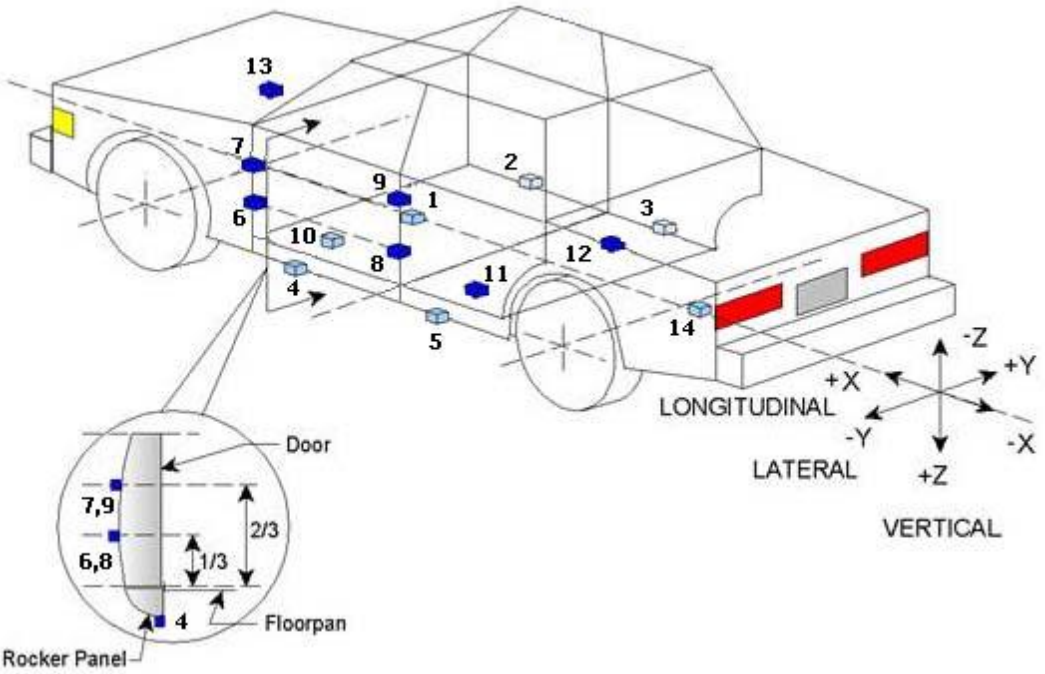
If applicable, explain why camera(s) did not operate as intended:

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MBD Accelerometers	7
TOTAL	62

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



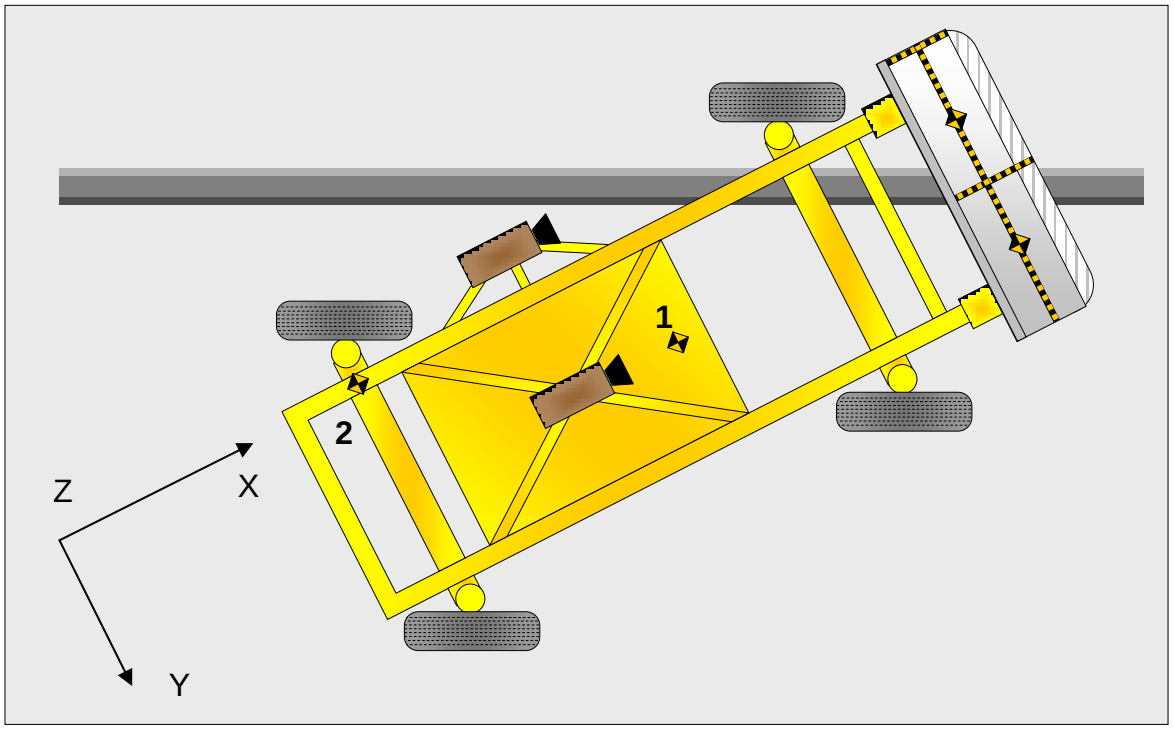
TEST VEHICLE ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2887	0	-435
2	Right Sill at Front Seat	3065	650	-360
3	Right Sill at Rear Seat	2205	650	-343
4	Left Sill at Front Door	3093	-650	-360
5	Left Sill at Rear Door	2215	-650	-355
6	A-Post Lower	3465	-785	-645
7	A-Post Middle	3480	-780	-965
8	B-Post Lower	2480	-790	-680
9	B-Post Middle	2460	-780	-1000
10	Front Seat Track	2620	-550	-426
11	Rear Seat Structure	2000	-620	-372
12	Right Rear Occ. Compartment	2150	600	-360
13	Engine Block	4215	125	-861
14	Rear Above Axle	1450	0	-572

Reference: X - Rear surface of vehicle (+ forward)
Y - Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	-2260	0	-520
2	MDB Rear	-3703	-677	-625

Reference : X - Face of MDB (+ forward)
Y - MDB Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES2-re)	Rear Seat Dummy (SID-IIs)
Face	NA	NA
Top of Head	NA	NA
Left Side of Head	SCAB, headliner	SCAB
Back of Head	NA	NA
Left Shoulder	Door panel	Door panel
Upper Torso	None	None
Lower Torso	None	None
Left Hip	Door panel	Door panel
Left Knee	Door panel	Door panel

POST TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	NA	NA	NA	NA	NA

* Indicate “Yes”, “No”, or “NA”.

POST TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

* Indicate “Yes”, “No”, or “NA”.

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	None
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	NA
Seat Belt Load Limiter	Yes	No	NA	NA
Other	NA	NA	NA	NA

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2640
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		378
Actual Impact Point (Aft of Front Axle)	mm		377
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact point	1 Forward
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact point	4 Up

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel Base of Framework Carriage	2587
C.G. Location aft of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	420.6	266.0	
Right	kg	363.2	317.8	
Ratio	%	57.3	42.7	
Totals	kg	783.8	583.8	1367.6

SPEED AND IMPACT ANGLE DATA

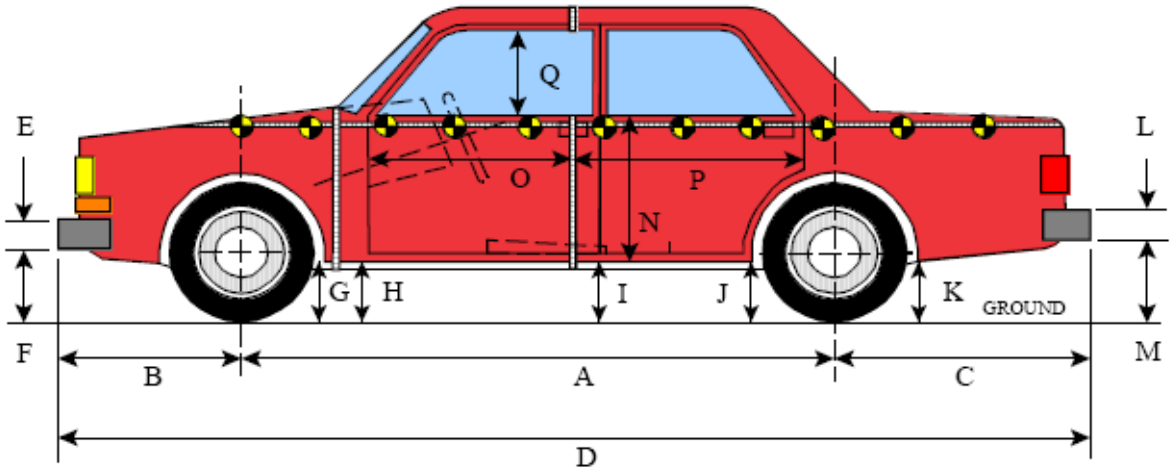
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.65
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.65
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.3
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.3
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	27.0

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	235
B	Top of Bumper	533	800	Right	163
C	Mid-Level	686	800	Left	172
D	Top of Stack	813	800	Left	199

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



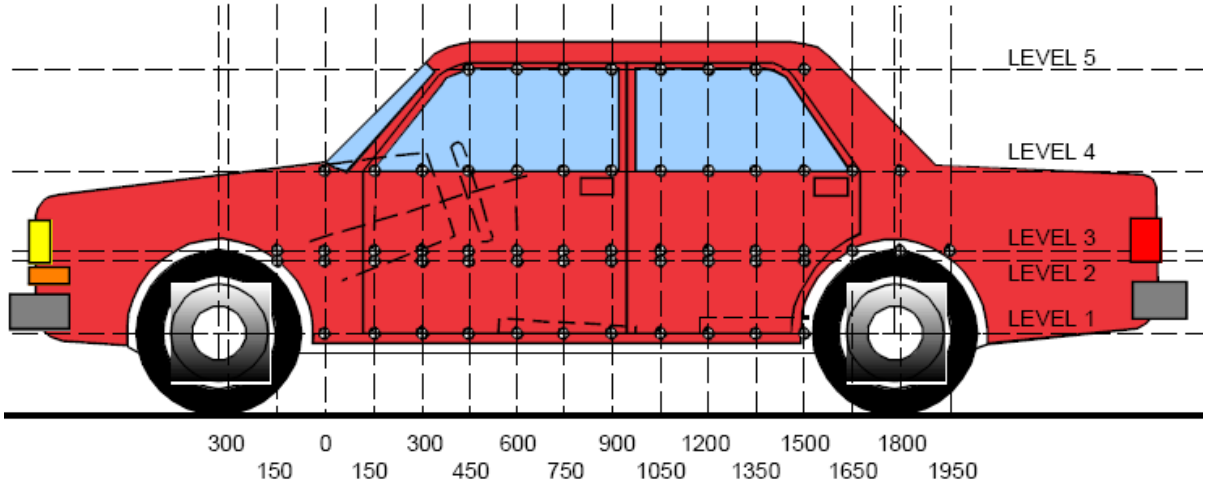
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2640	2647	-7
B	Front Axle to Front Surface of Vehicle	890	890	0
C	Rear Axle to Rear Surface of Vehicle	885	885	0
D	Total Length at Centerline	4415	4413	2
E	Front Bumper Thickness	108	108	0
F	Front Bumper Bottom to Ground	507	520	-13
G	Sill Height at Front Wheel Well	255	267	-12
H	Sill Height at Front Door Leading Edge	290	303	-13
I	Sill Height at B-Pillar	280	341	-61
J1	Sill Height at Rear Wheel Well	240	281	-41
J2	Pinch Weld Height at Rear Wheel Well	253	300	-47
K	Sill Height Aft of Rear Wheel Well	325	372	-47
L	Rear Bumper Thickness	180	180	0
M	Rear Bumper Bottom to Ground	497	543	-46
N	Sill Height to Window Bottom Sill	785	735	50
O	Front Door Leading Edge to Impact CL	714	706	8
P	Rear Door Trailing Edge to Impact CL	1196	1175	21
Q	Front Window Opening	392	392	0
R	Right Side Length	4205	4197	8
S	Left Side Length	4205	4195	10
T	Vehicle Width at B Pillar	1355	1303	52

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance From Impact
1	Sill Top	418	104	600
2	Driver Hip Point	667	175	1350
3	Mid-Door	741	179	1500
4	Window Sill	1016	90	1350
5	Window Top	1580	1	1350

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

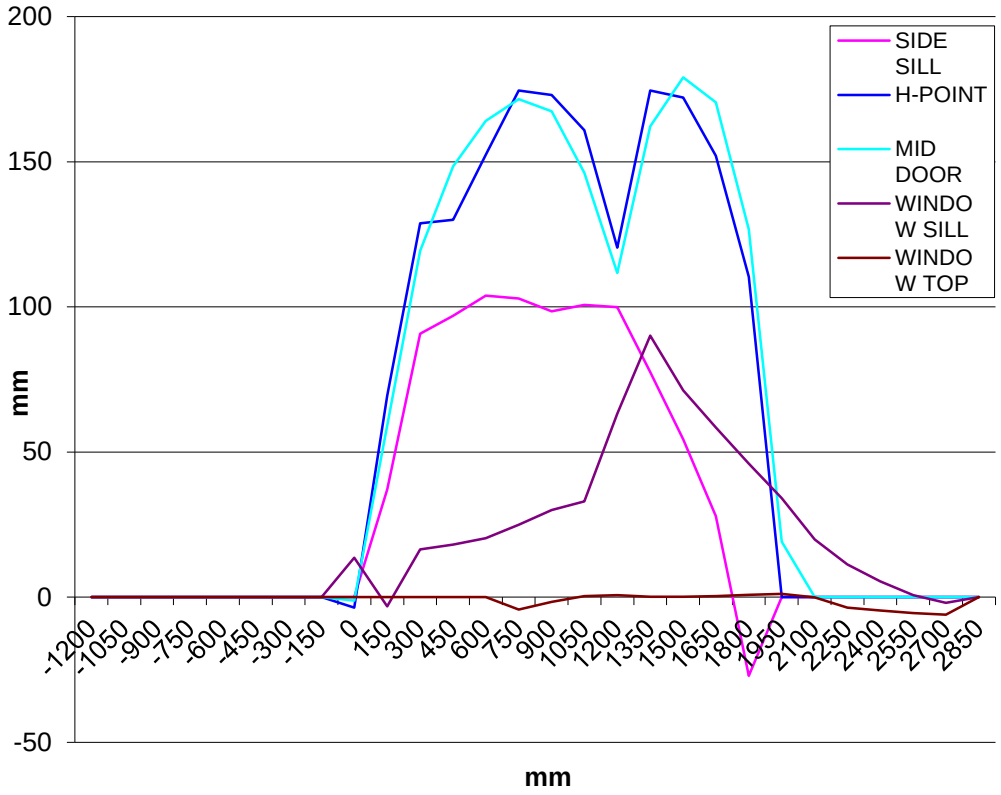
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	871	873	788	0	0	874	874	775	0	0	-3	-1	13	0
150	826	851	855	799	0	789	782	796	802	0	37	69	59	-3	0
300	827	853	857	809	0	737	724	738	793	0	90	129	119	16	0
450	831	855	859	821	0	734	725	711	803	0	97	130	148	18	0
600	833	858	860	832	0	729	706	696	812	0	104	152	164	20	0
750	833	861	861	843	605	730	687	690	818	609	103	174	171	25	-4
900	833	864	863	852	615	735	691	695	822	616	98	173	168	30	-1
1050	833	867	864	856	623	732	706	718	823	622	101	161	146	33	1
1200	834	868	864	854	629	734	747	752	791	628	100	121	112	63	1
1350	832	867	863	854	630	755	692	701	764	629	77	175	162	90	1
1500	832	865	861	853	630	777	693	682	782	630	55	172	179	71	0
1650	831	863	860	851	630	803	711	690	793	630	28	152	170	58	0
1800	840	865	860	844	630	867	755	734	798	629	-27	110	126	46	1
1950	0	0	884	847	627	0	0	865	813	626	0	0	19	34	1
2100	0	0	0	841	623	0	0	0	821	623	0	0	0	20	0
2250	0	0	0	835	619	0	0	0	824	622	0	0	0	11	-3
2400	0	0	0	828	613	0	0	0	823	617	0	0	0	5	-4
2550	0	0	0	820	606	0	0	0	819	611	0	0	0	1	-5
2700	0	0	0	809	597	0	0	0	811	603	0	0	0	-2	-6
2850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition.

Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

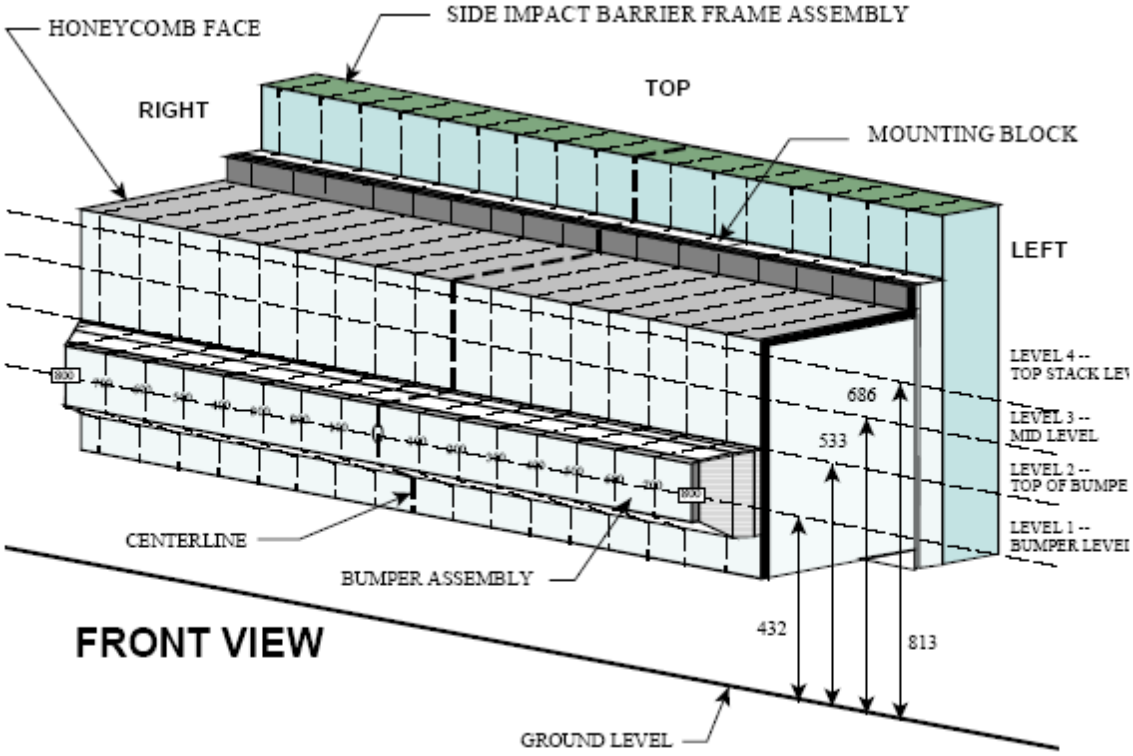
DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	-70	-52	-46	-72	-74	-101	-114	-100	-73	-66	-67	-76	-81	-87	-97	-136	-199
2	-80	-67	-59	-76	-95	-93	-104	-73	-56	-47	-42	-48	-56	-66	-83	-119	-172
3	-163	-158	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	-117	-118	-117	-118	-122	-131	-163
4	-235	-226	-219	-204	-190	-182	-179	-180	-181	-181	-181	-181	-182	-183	-186	-196	-202

[1] Measurement point missing post-test.

DATA SHEET NO. 13
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312
Test Program: NCAP Side Impact Test Date: 10/16/12

Test Time: 15:30 **Temperature:** 22

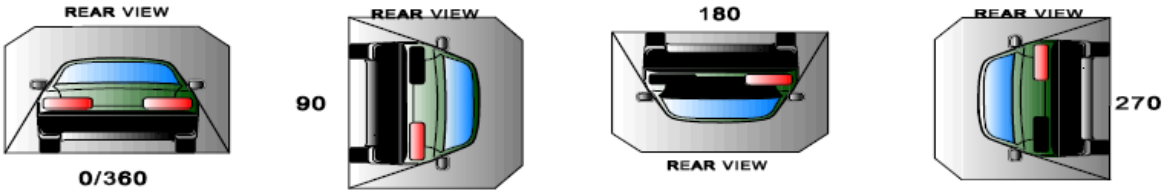
A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 ounce)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable is 5 ounces)

C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 ounce/minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	120	300	420
90 to 180	120	300	840
180 to 270	120	300	1260
270 to 360	120	300	1680

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	NA
90 to 180	0	0	0	NA
180 to 270	0	0	0	NA
270 to 360	0	0	0	NA

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

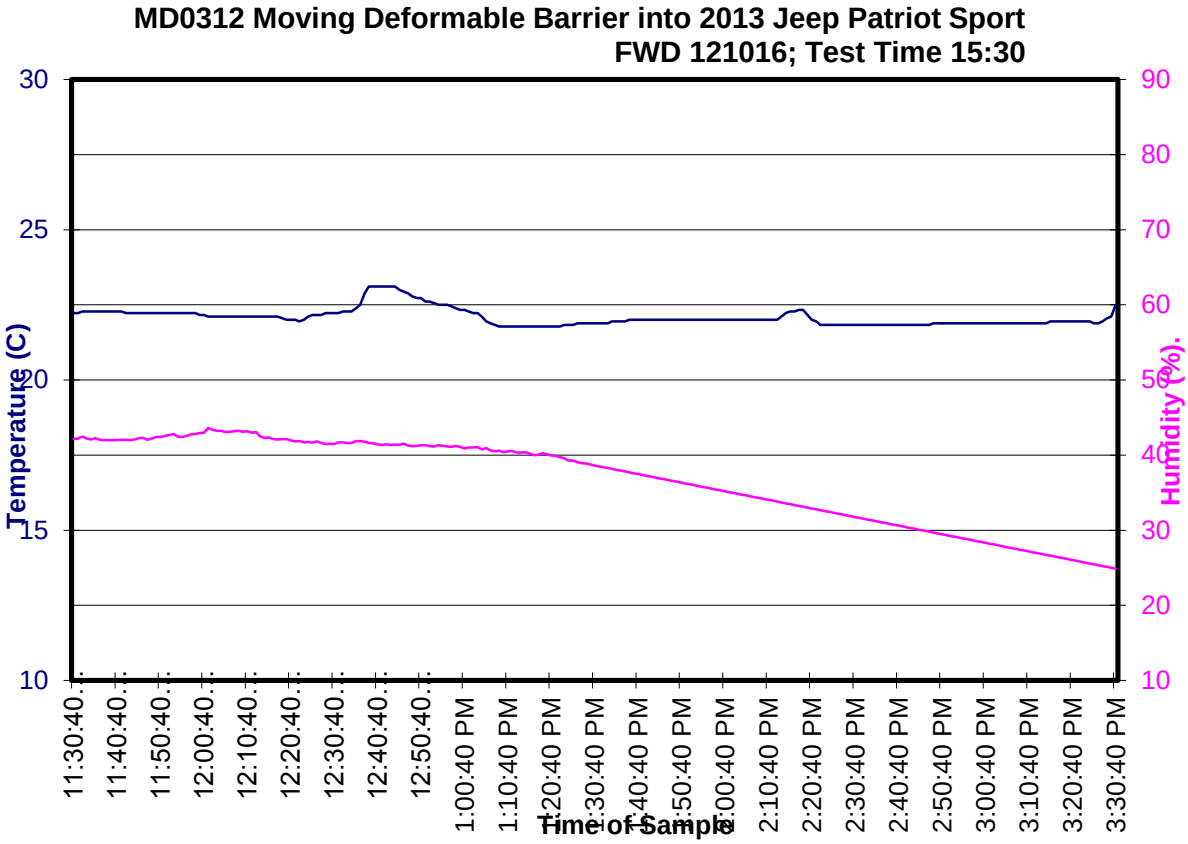
Test Phase	Spillage Location
0 to 90	None
90 to 180	None
180 to 270	None
270 to 360	None

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2013 Jeep Patriot Sport FWD MPV NHTSA No.: MD0312

Test Program: NCAP Side Impact Test Date: 10/16/12



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

TABLE OF PHOTOGRAPHS (CONTINUED)

001 As-Delivered Right Front ¾ View of Test Vehicle

002 As-Delivered Left Rear ¾ View of Test Vehicle

003 Pre-Test Front View of Test Vehicle

004 Post-Test Front View of Test Vehicle

005 Pre-Test Left Front ¾ View of Test Vehicle

006 Post-Test Left Front ¾ View of Test Vehicle

007 Pre-Test Left Side View of Test Vehicle

008 Post-Test Left Side View of Test Vehicle

009 Pre-Test Left Rear ¾ View of Test Vehicle

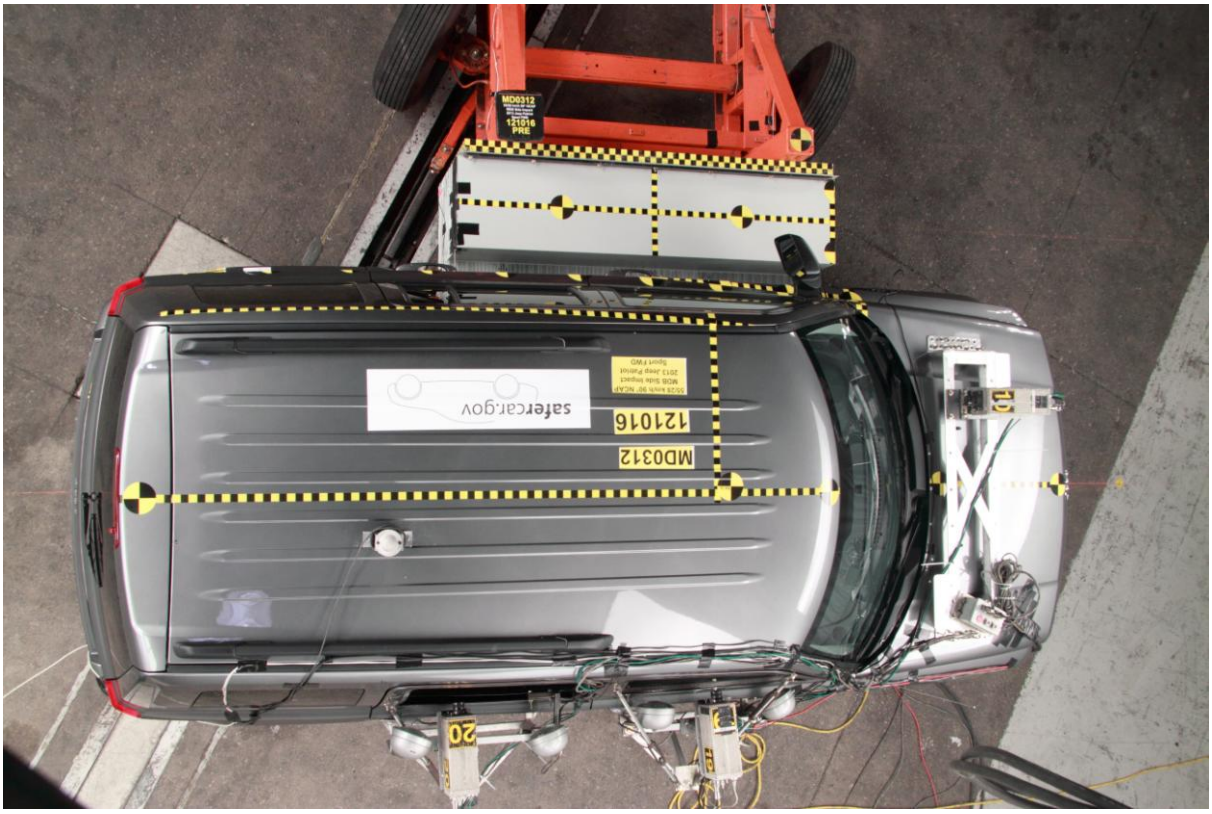
010 Post-Test Left Rear ¾ View of Test Vehicle

011 Pre-Test Rear View of Test Vehicle

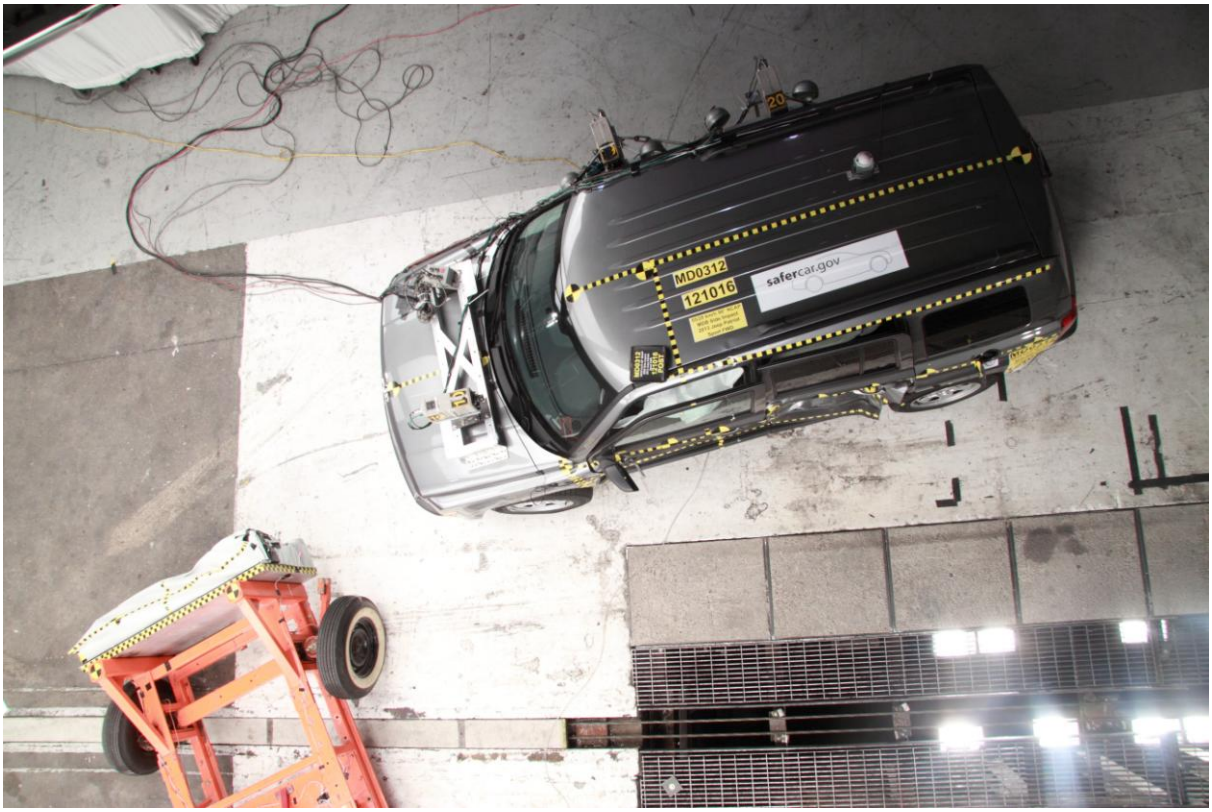
012 Post-Test Rear View of Test Vehicle

013 Pre-Test Right Side View of Test Vehicle

014 Post-Test Right Side View of Test Vehicle



015 Pre-Test Overhead View of Test Area



016 Post-Test Overhead View of Test Area

017 Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle

018 Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle

019 Pre-Test Close-up View of Impact Point Target

020 Post-Test Close-up View of Impact Point Target

021 Pre-Test Left Front Door Latch Close-up

022 Post-Test Left Front Door Latch Close-up

023 Pre-Test Left Rear Door Latch Close-up

024 Post-Test Left Rear Door Latch Close-up

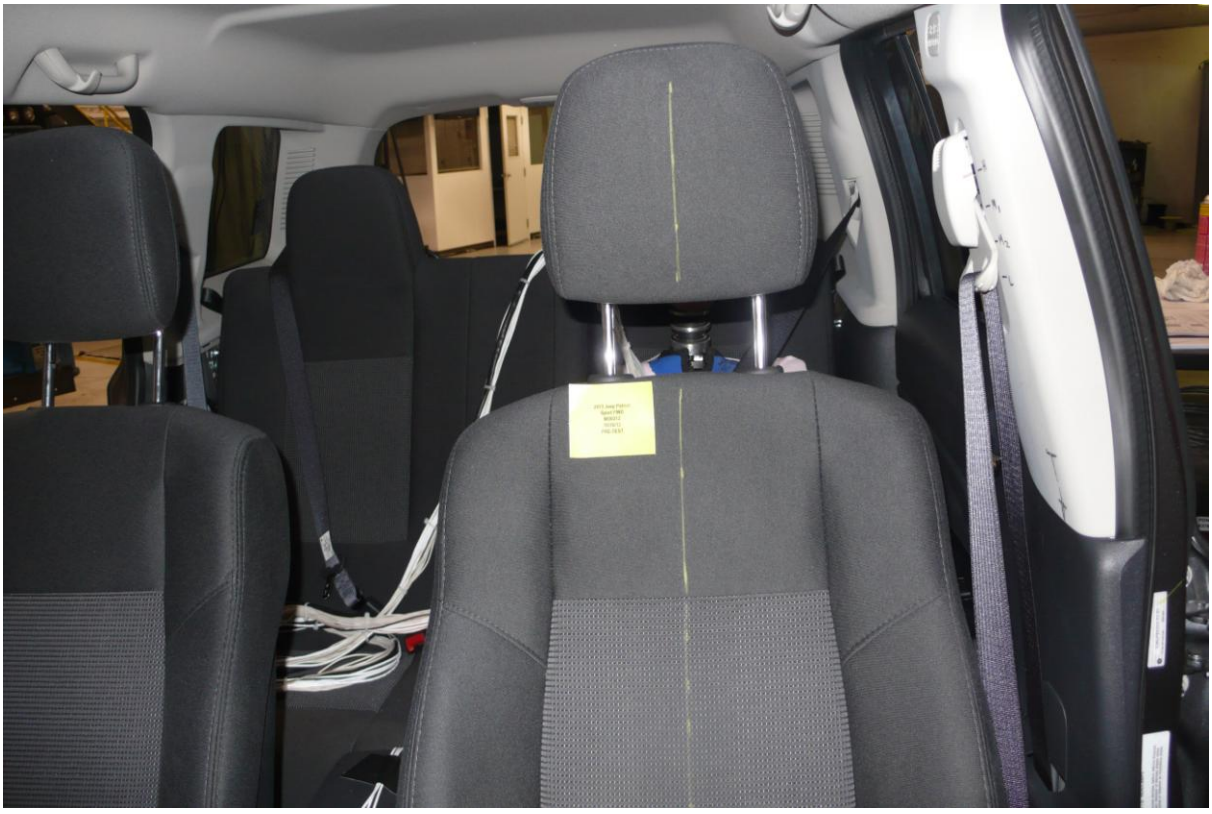
025 Pre-Test Front Close-up View of Driver Dummy

026 Post-Test Front Close-up View of Driver Dummy

027 Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking

028 Pre-Test Left Side View of Driver Dummy Shoulder and Door Top

029 Post-Test Left Side View of Driver Dummy Shoulder and Door Top



030 Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning

031 Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

032 Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning

033 Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

034 Pre-Test Placement of Driver Dummy Feet

035 Pre-Test View of Belt Anchorage for Driver Dummy

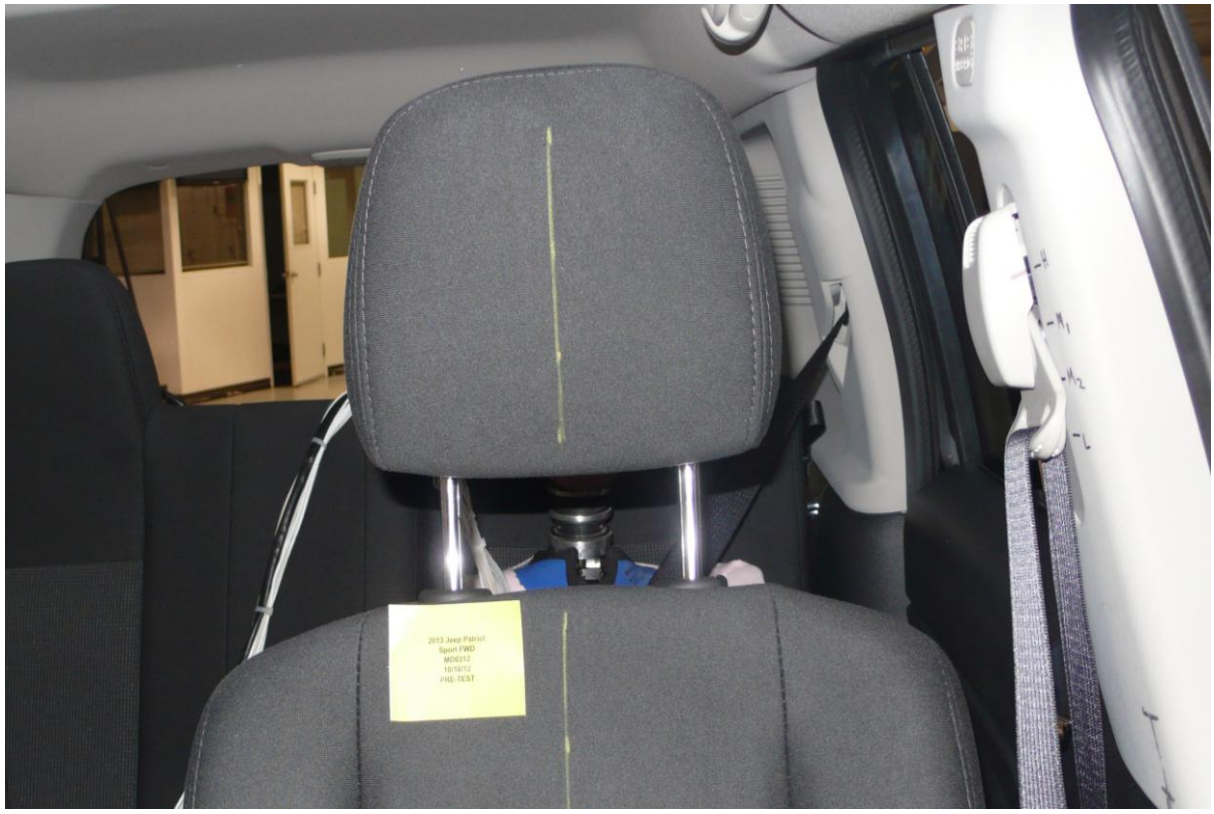
036 Pre-Test Left Side View of Steering Wheel

037 View of Disengaged Parking Brake

038 Pre-Test View of Parking Brake

039 Pre-Test Close-Up Left Side View of Driver Seat Track

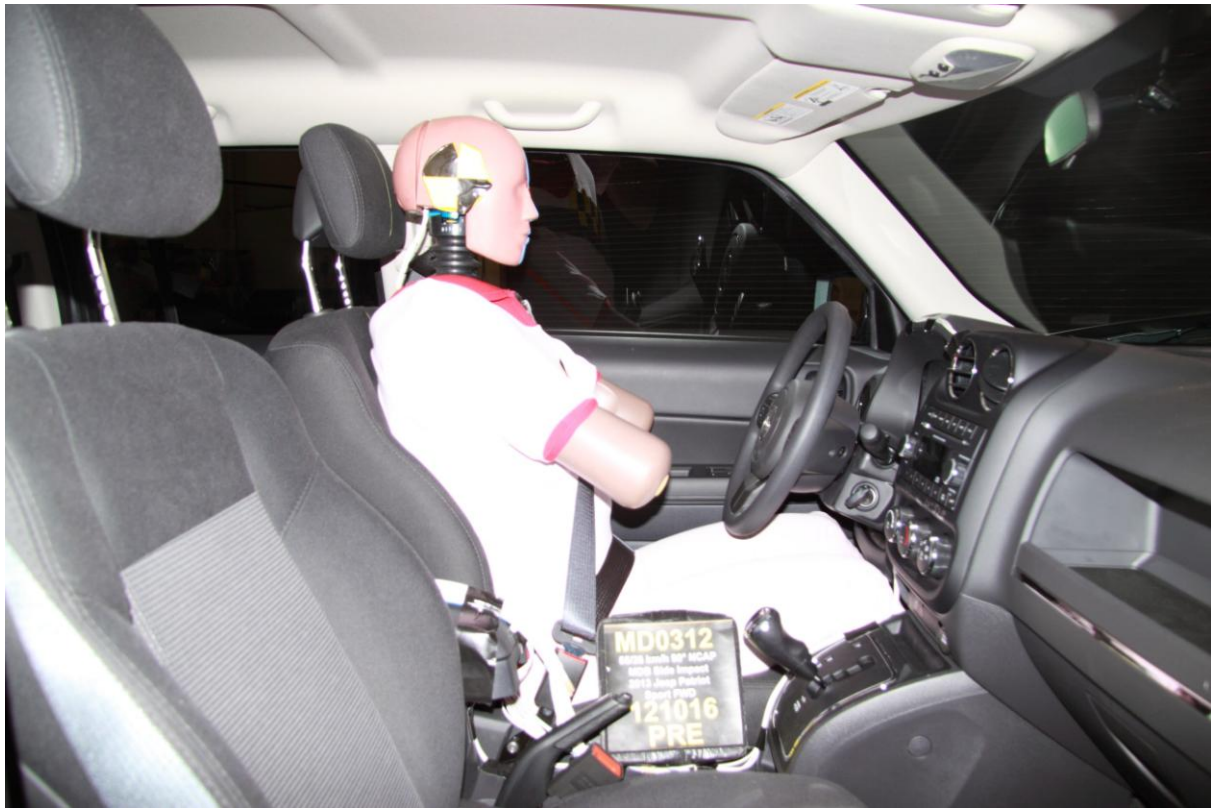
040 Pre-Test Close-Up Left Side View of Driver Seat Back



041 Pre-Test Close-Up View of Driver Seat Back or Head Restraint

042 Pre-Test Driver Dummy and Door Clearance View

043 Post-Test Driver Dummy and Door Clearance View



044 Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

045 Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

046 Pre-Test Driver Inner Door Panel View

047 Post-Test Driver Inner Door Panel View

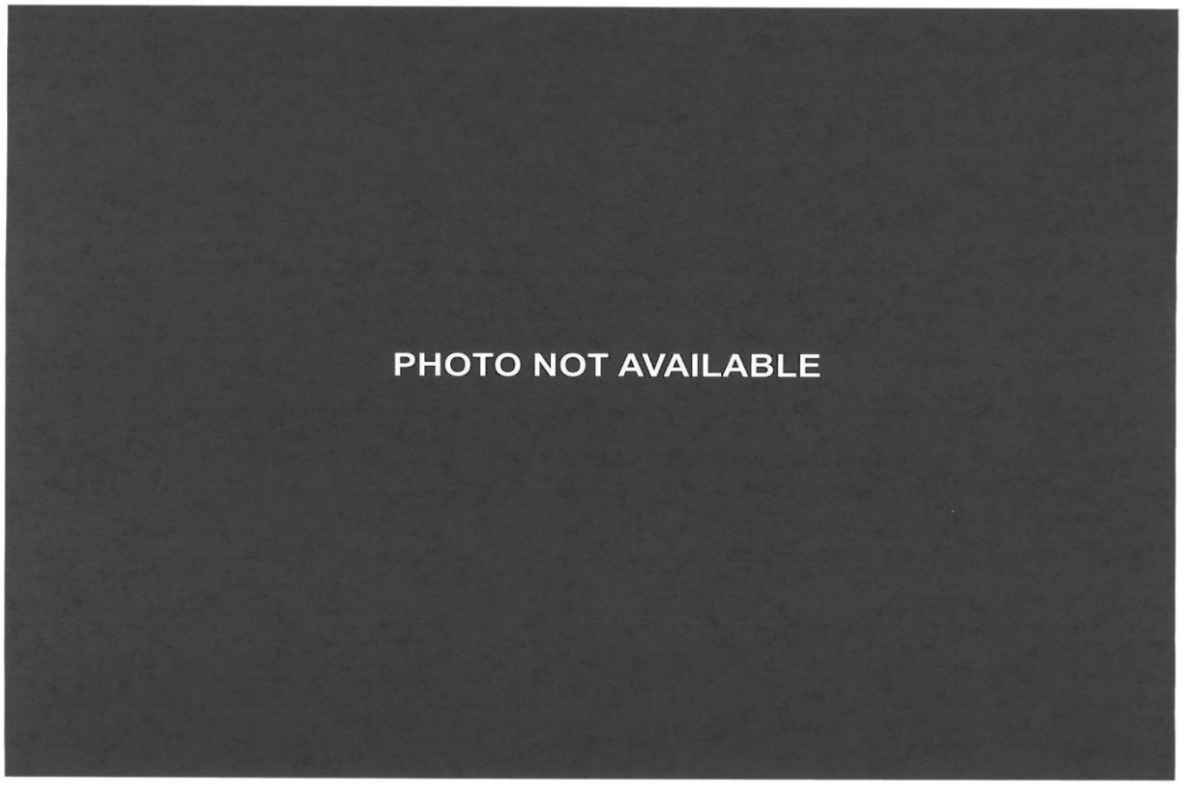
048 Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

049 Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

050 Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

051 Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

052 Post-Test Driver Dummy Close-Up Pelvis Contact View



053 Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

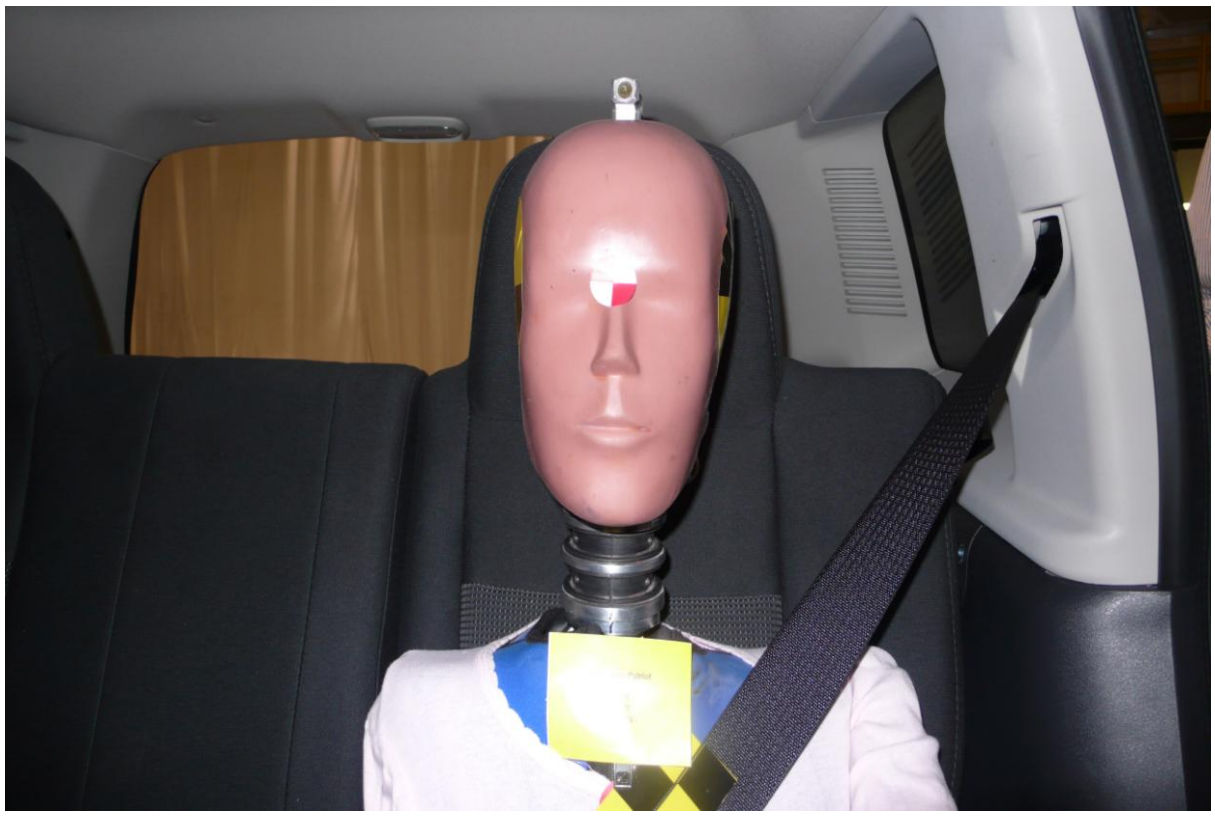
054 Post-Test Driver Dummy Close-Up Knee Contact View

055 Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking

056 Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View

057 Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View

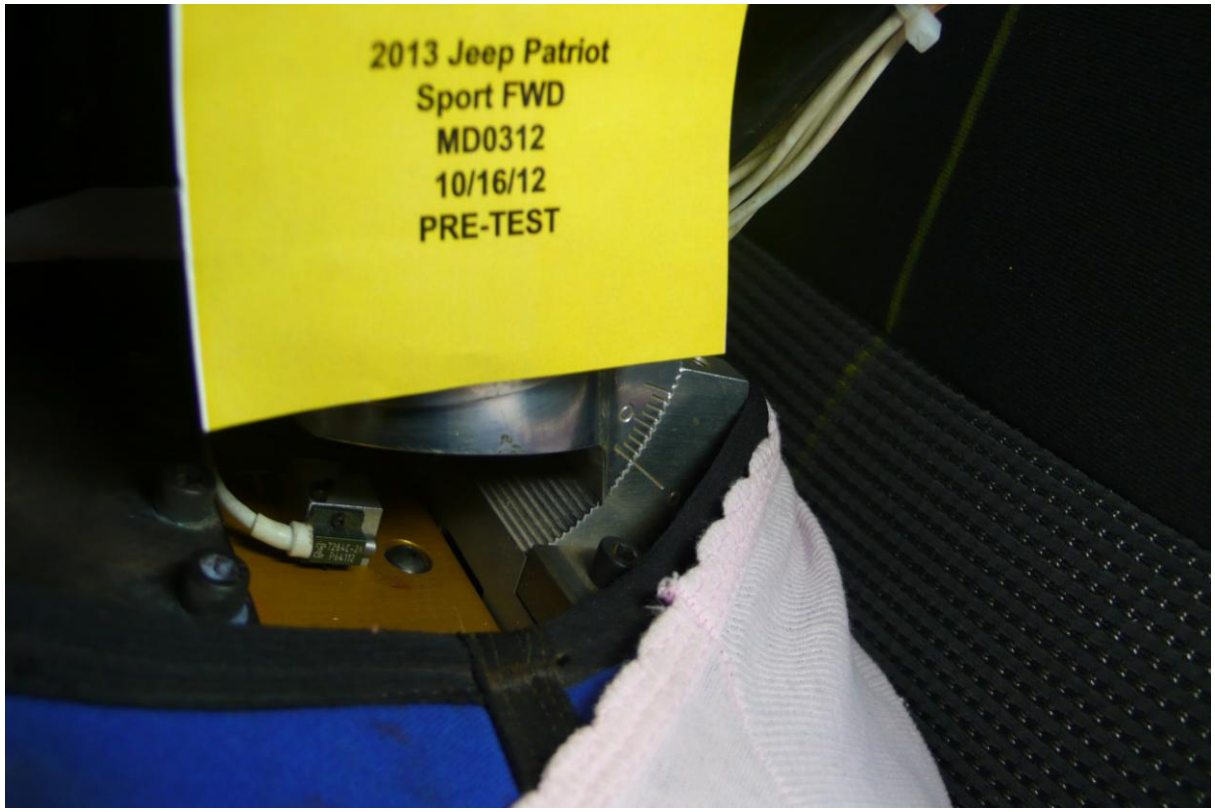
058 Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



059 Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

060 Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning

061 Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



062 Pre-Test View of Rear Passenger Dummy Neck Showing Position of Adjustable Neck Bracket

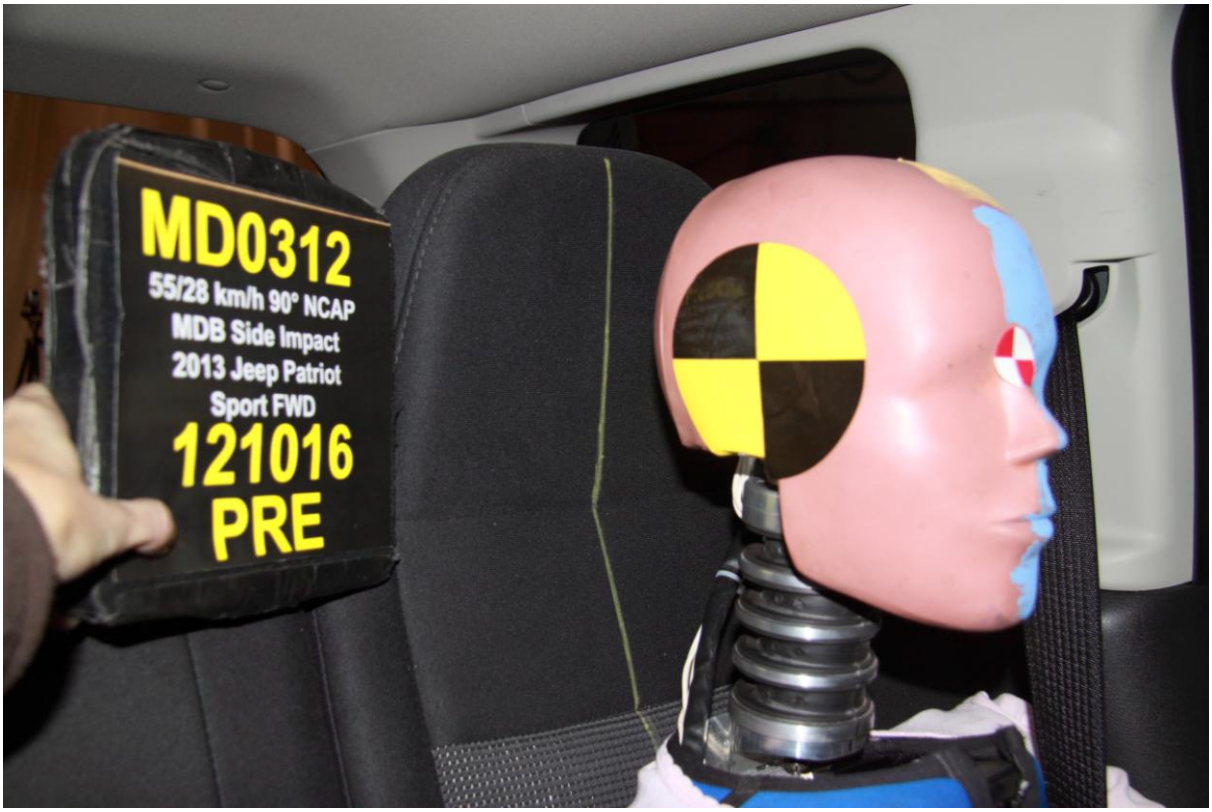
063 Pre-Test View of Rear Passenger Dummy Head Showing Dummy Head is Level

064 Pre-Test Placement of Rear Passenger Dummy Feet

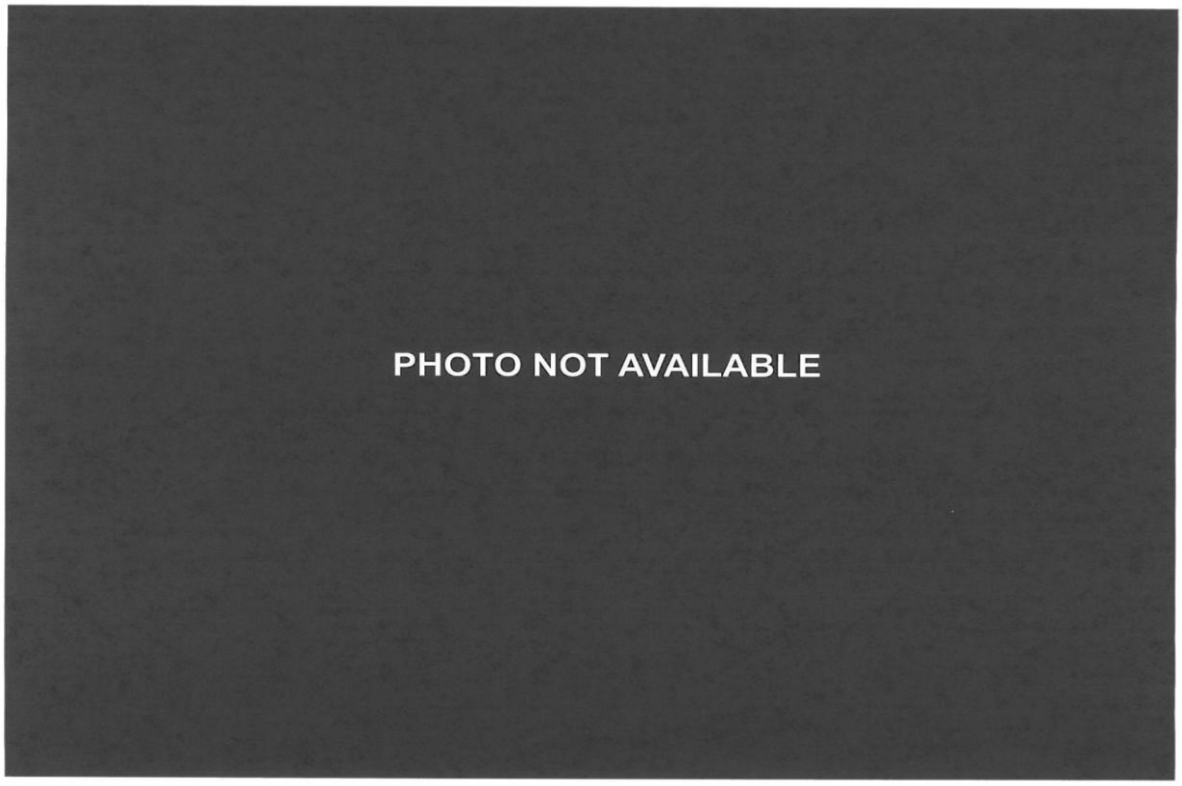
065 Pre-Test View of Belt Anchorage for Rear Passenger Dummy

066 Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

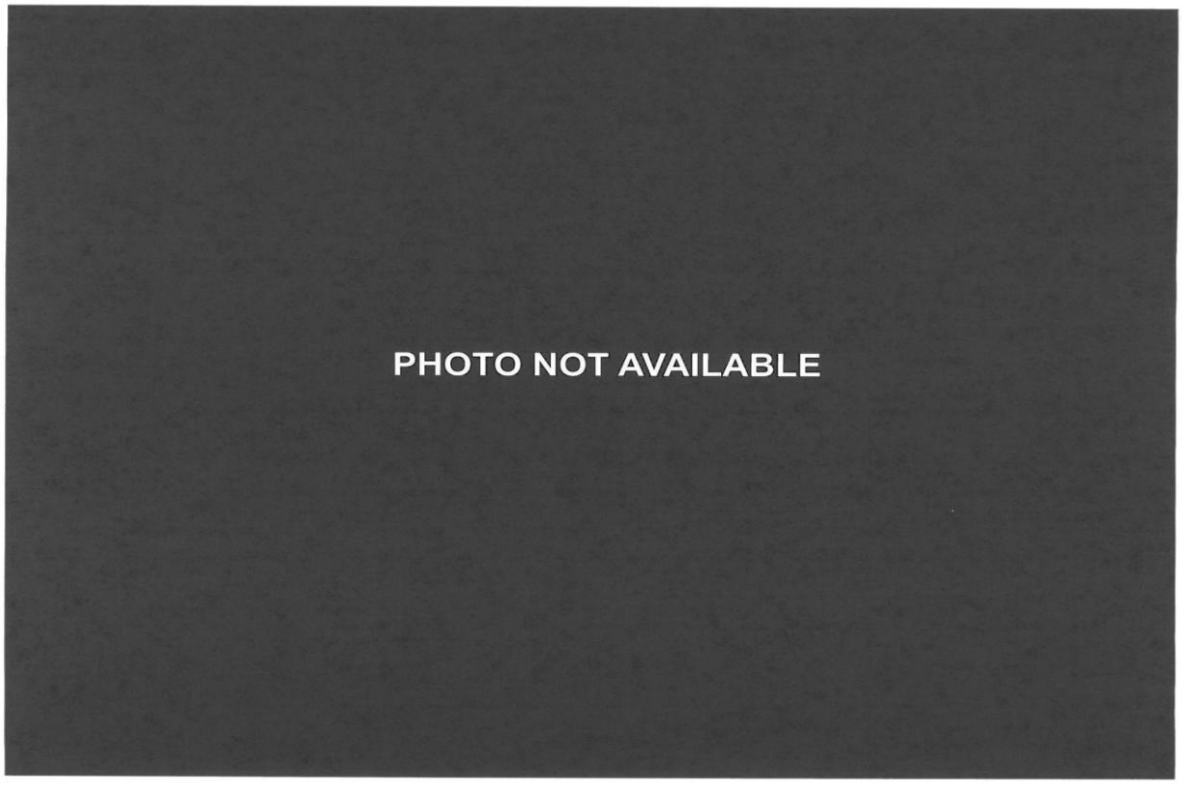
067 Pre-test Close-Up Left Side View of Rear Passenger Seat Back



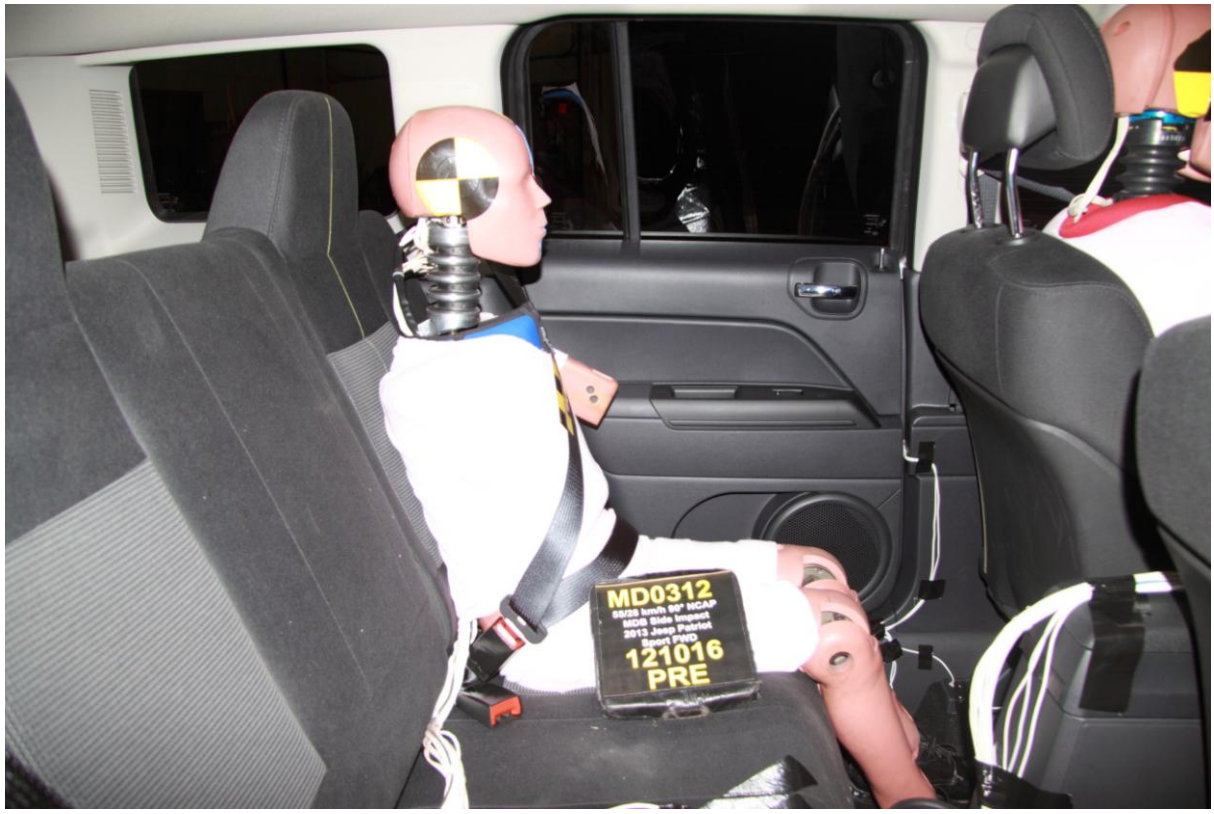
068 Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



069 Pre-Test Passenger Dummy and Door Clearance View



070 Post-Test Passenger Dummy and Door Clearance View



071 Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

072 Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

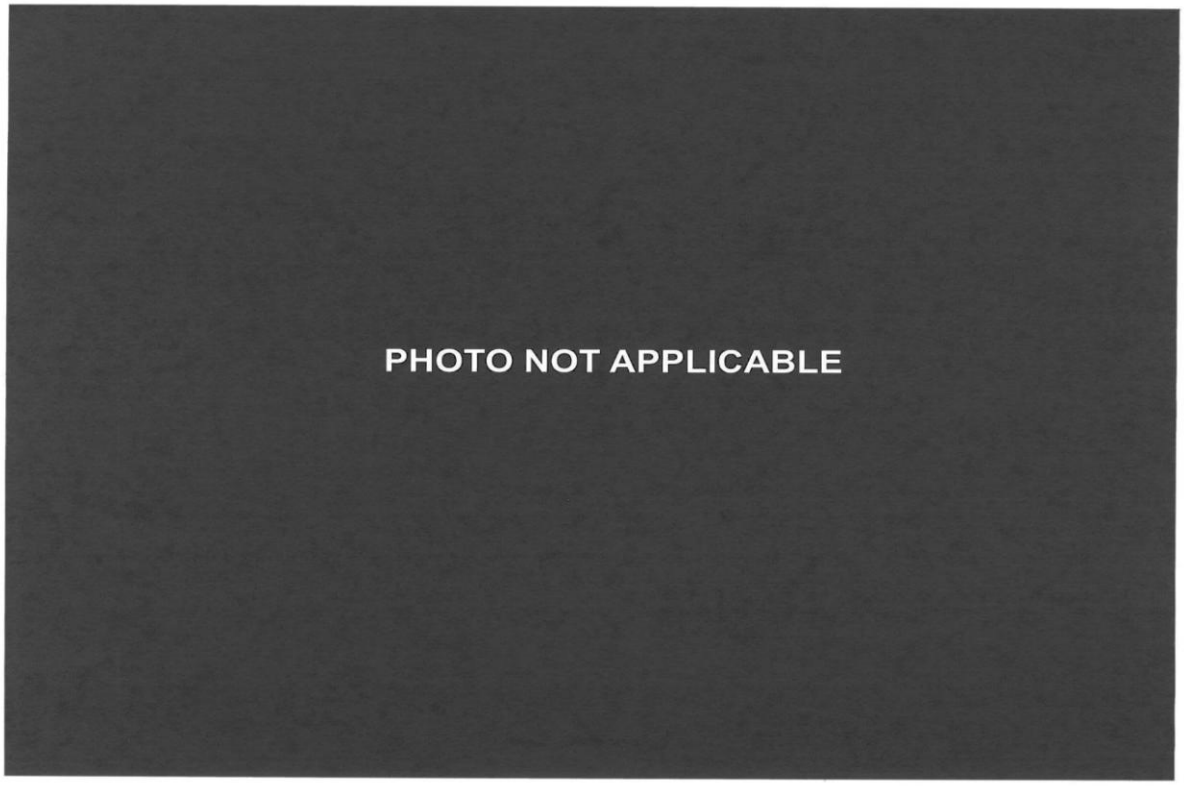
073 Pre-Test Passenger Inner Door Panel View

074 Post-Test Passenger Inner Door Panel View

075 Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

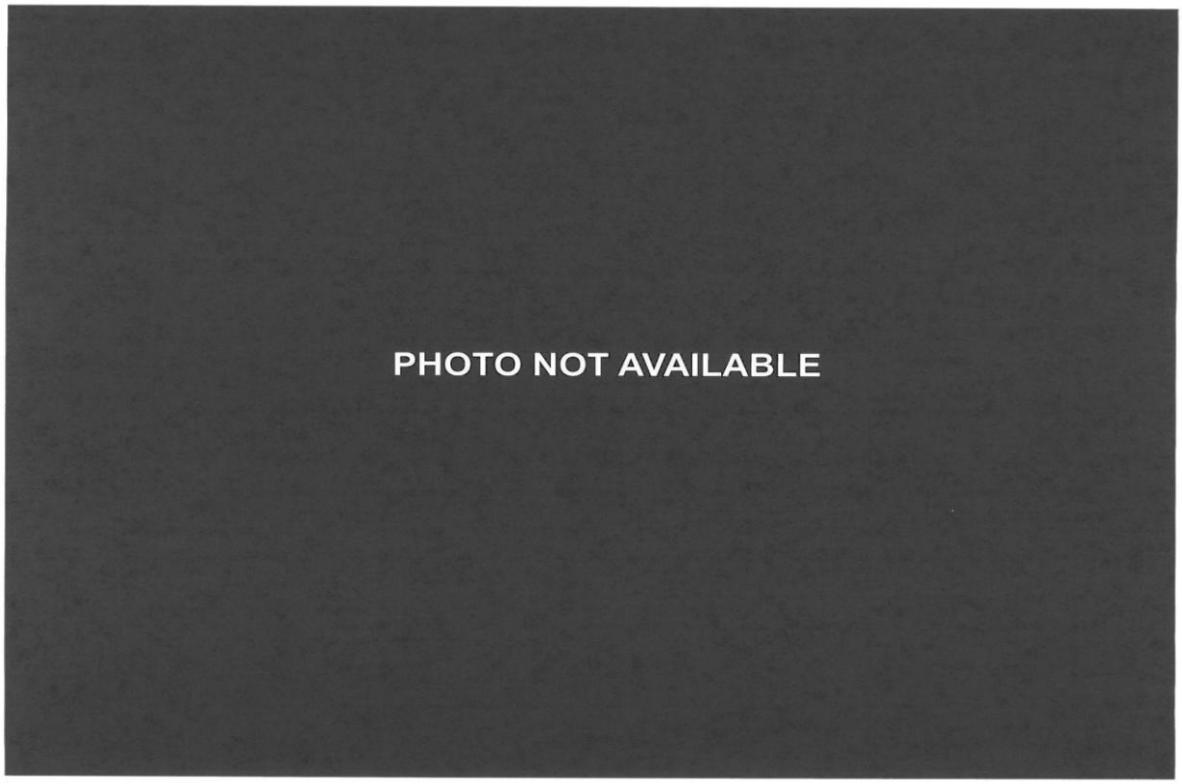
076 Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

077 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View



078 Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

079 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View



080 Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

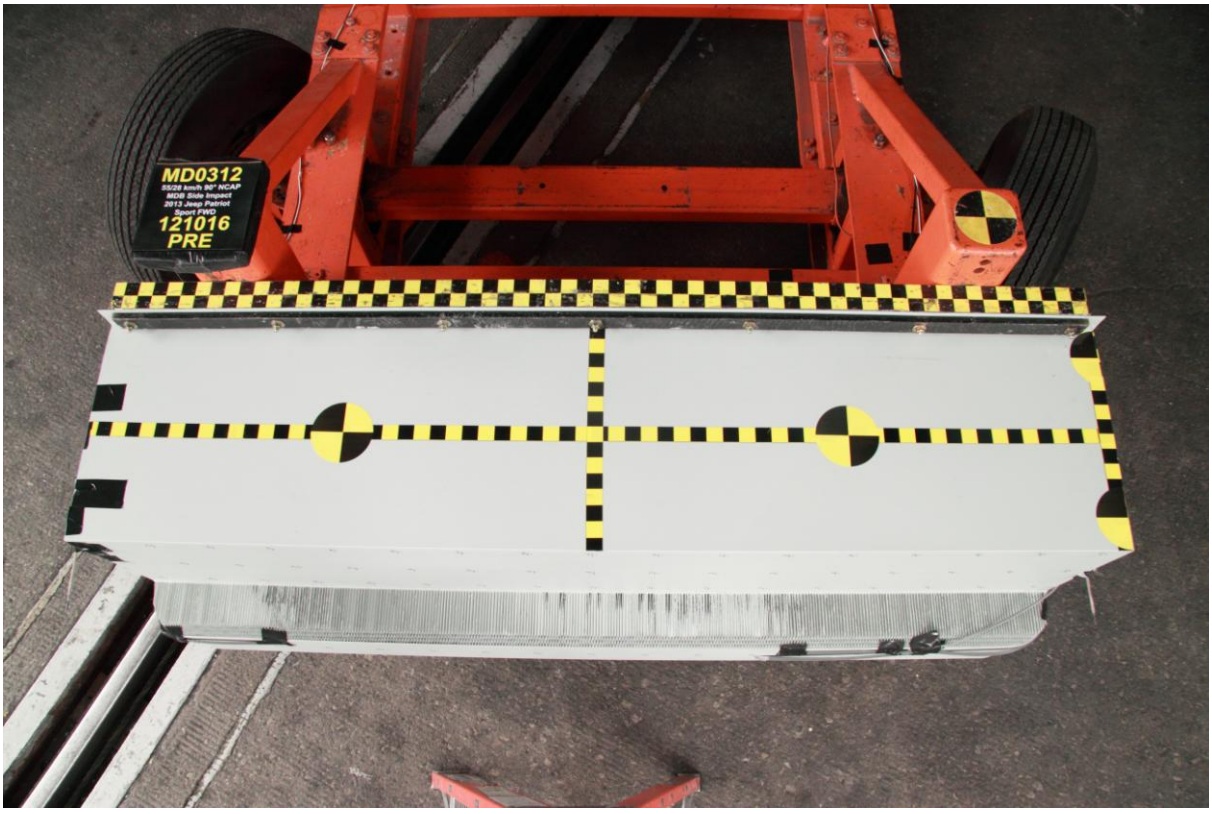
081 Post-Test Rear Passenger Dummy Close-Up Knee Contact View

082 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

083 Post-Test View of Fuel Filler Cap or Fuel Filler Neck

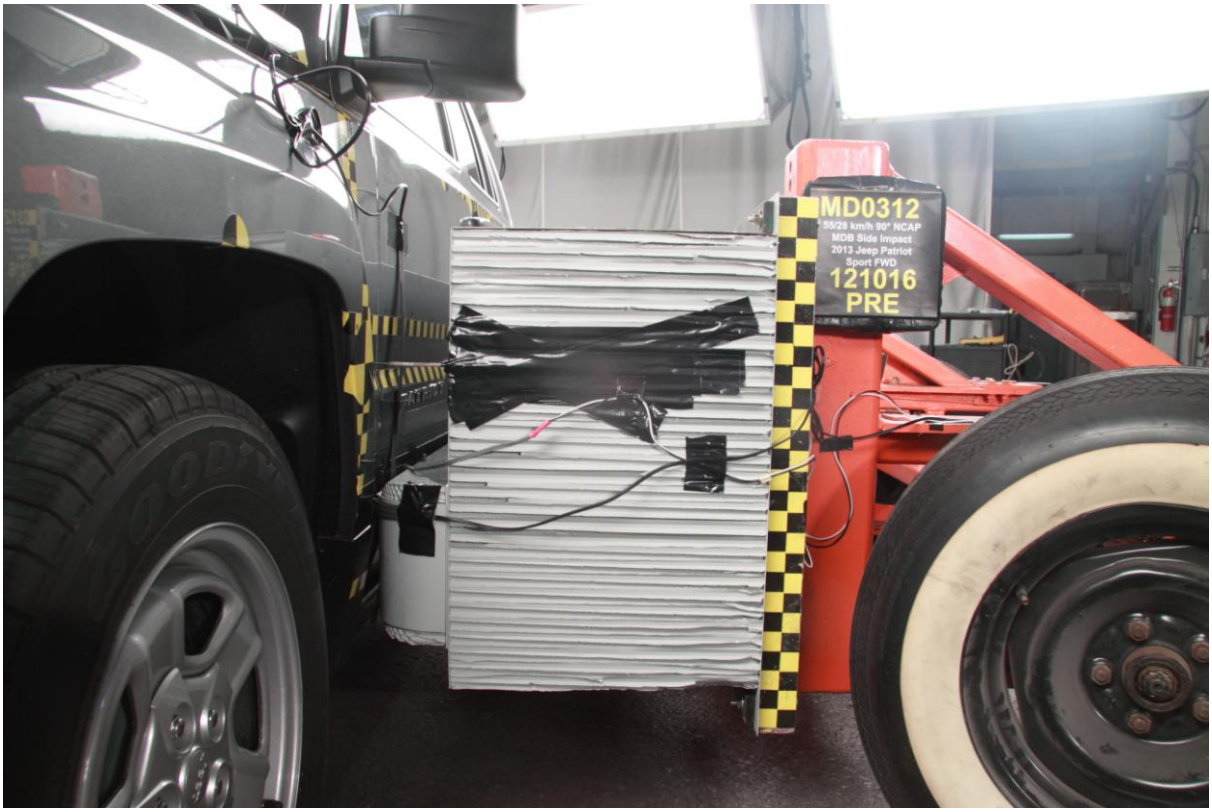
084 Pre-Test Front View of MDB Impactor Face

085 Post-Test Front View of MDB Impactor Face

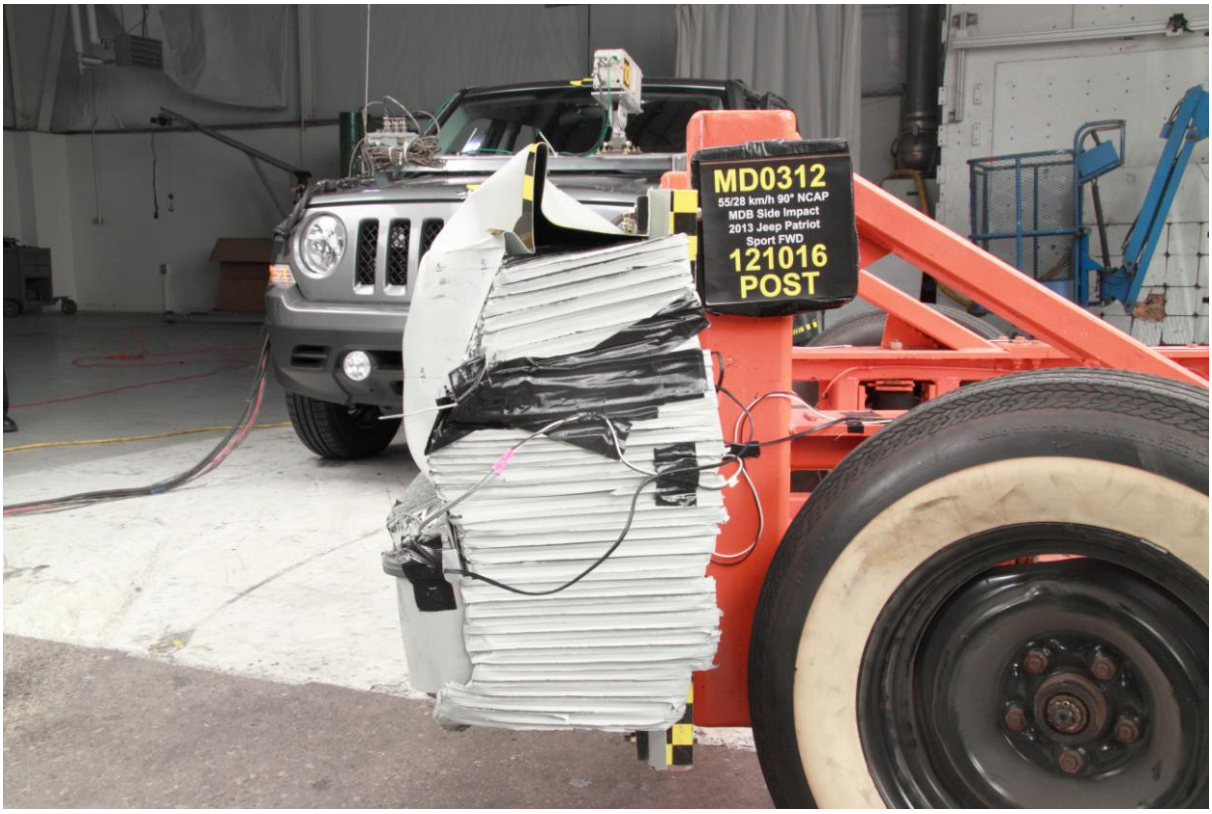


086 Pre-Test Top View of MDB Impactor Face

087 Post-Test Top View of MDB Impactor Face



088 Pre-Test Left Side View of MDB Impactor Face



089 Post-Test Left Side View of MDB Impactor Face

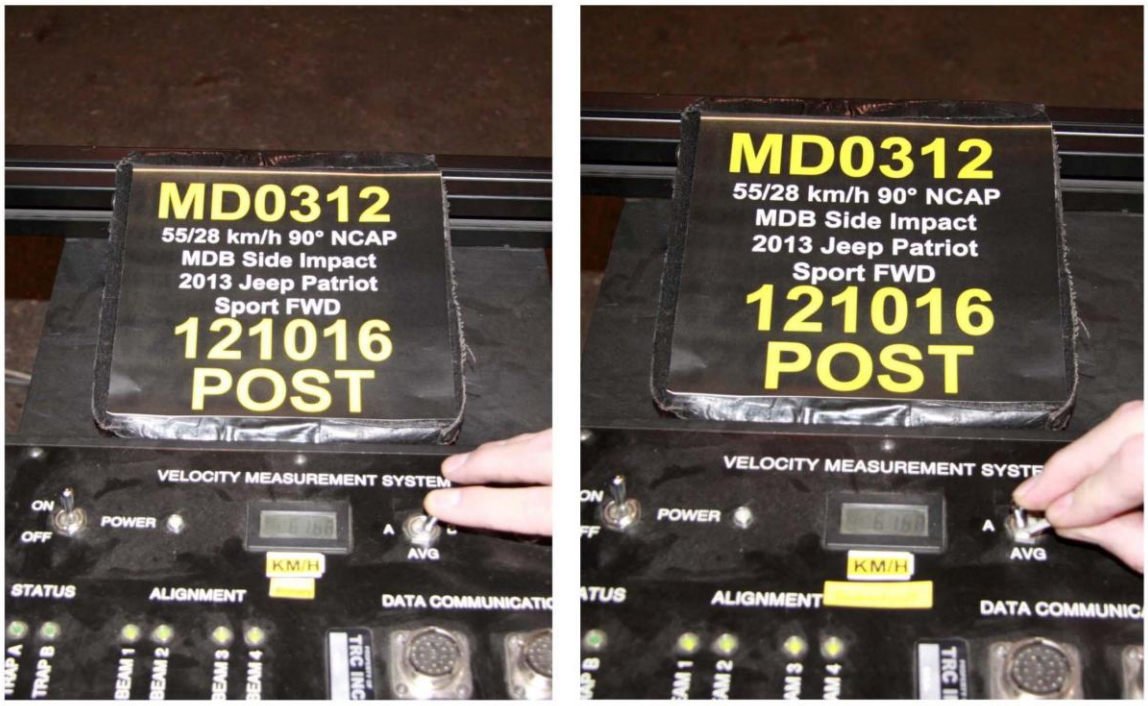
090 Pre-Test Right Side View of MDB Impactor Face

091 Post-Test Right Side View of MDB Impactor Face

092 Close-Up View of Vehicle Certification Label

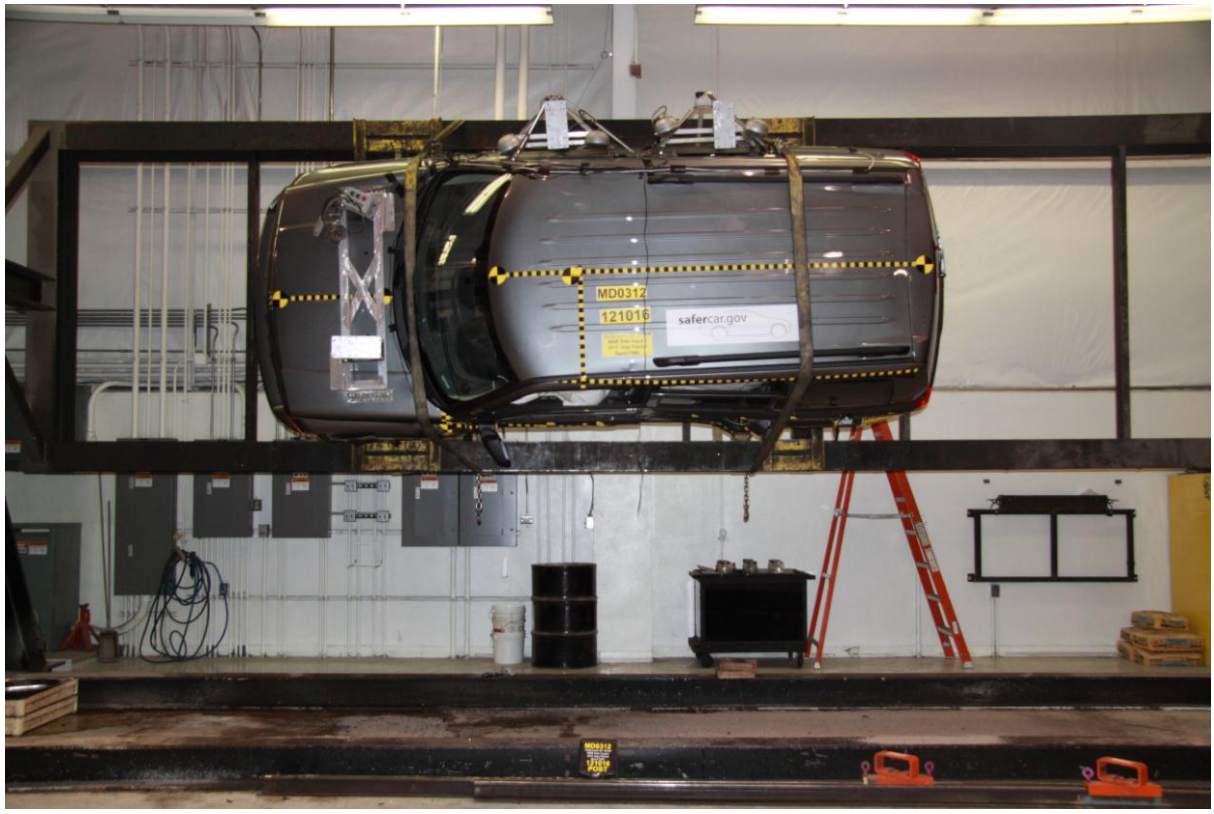
093 Close-Up View of Vehicle Tire Information Placard or Label

094 Pre-Test Ballast View



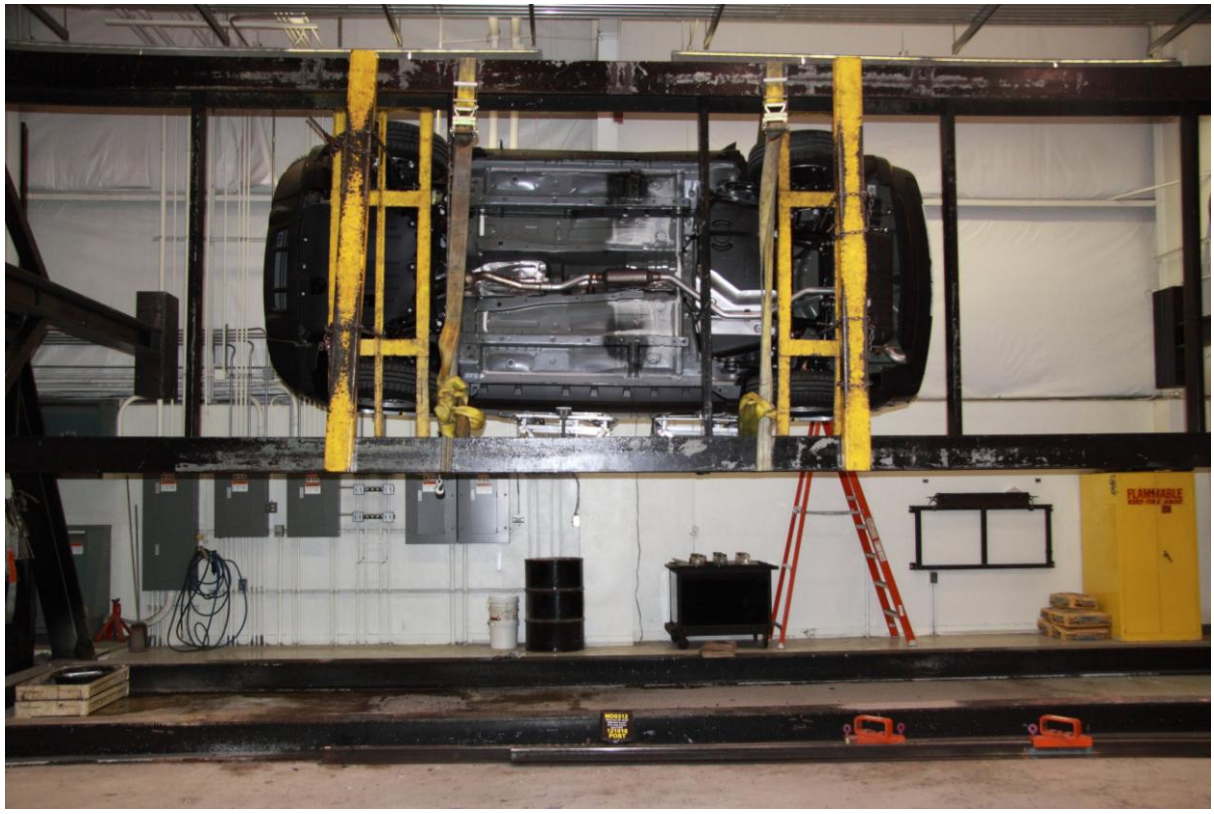
095 Post-Test Primary Speed Trap Read-Out

096 FMVSS No. 301 Static Rollover 0 Degrees



097 FMVSS No. 301 Static Rollover 90 Degrees

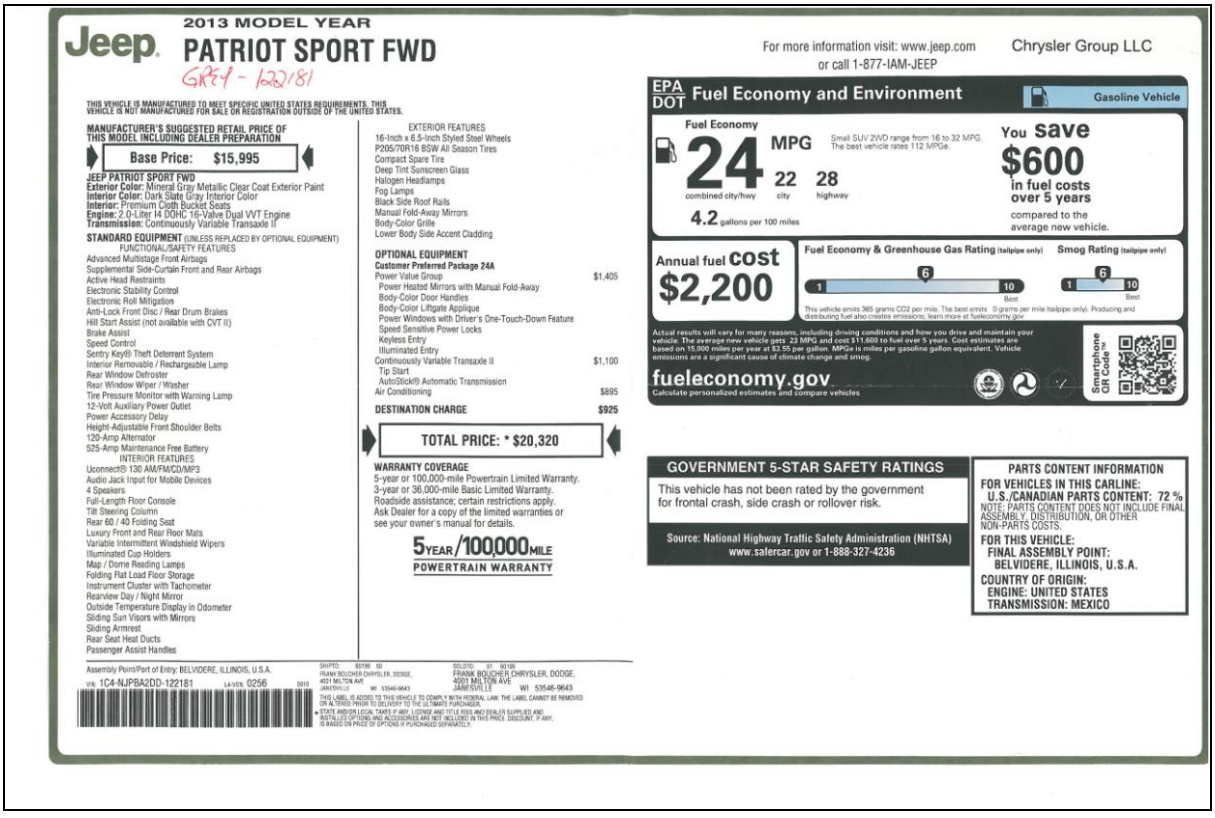
098 FMVSS No. 301 Static Rollover 180 Degrees



099 FMVSS No. 301 Static Rollover 270 Degrees

100 FMVSS No. 301 Static Rollover 360 Degrees

101 Impact Event



102 Monroney Label

Supplemental Active Head Restraints (AHR) — If Equipped

These head restraints are passive, deployable components, and vehicles with this equipment cannot be readily identified by any markings, only through visual inspection of the head restraint. The head restraint will be split in two halves, with the front half being soft foam and trim, the back half being decorative plastic.

How The Active Head Restraints (AHR) Work

The Occupant Restraint Controller (ORC) determines whether the severity, or type of rear impact will require the Active Head Restraints (AHR) to deploy. If a rear impact requires deployment, both the driver and front passenger seat AHRs will be deployed.

When AHRs deploy during a rear impact, the front half of the head restraint extends forward to minimize the gap between the back of the occupant's head and the AHR. This system is designed to help prevent or reduce the extent of injuries to the driver and front passenger in certain types of rear impacts.

NOTE:

The Active Head Restraints (AHR) may or may not deploy in the event of a front or side impact. However if during a front impact, a secondary rear impact occurs, the AHR may deploy based on the severity and type of the impact.

Active Head Restraint (AHR) Components

1 — Head Restraint Front Half (Soft Foam and Trim)	3 — Head Restraint Back Half (Decorative Plastic Rear Cover)
2 — Seatback	4 — Head Restraint Guide Tubes

CAUTION!

All occupants, including the driver, should not operate a vehicle or sit in a vehicle's seat until the head restraints are placed in their proper positions in order to minimize the risk of neck injury in the event of a collision.

NOTE:

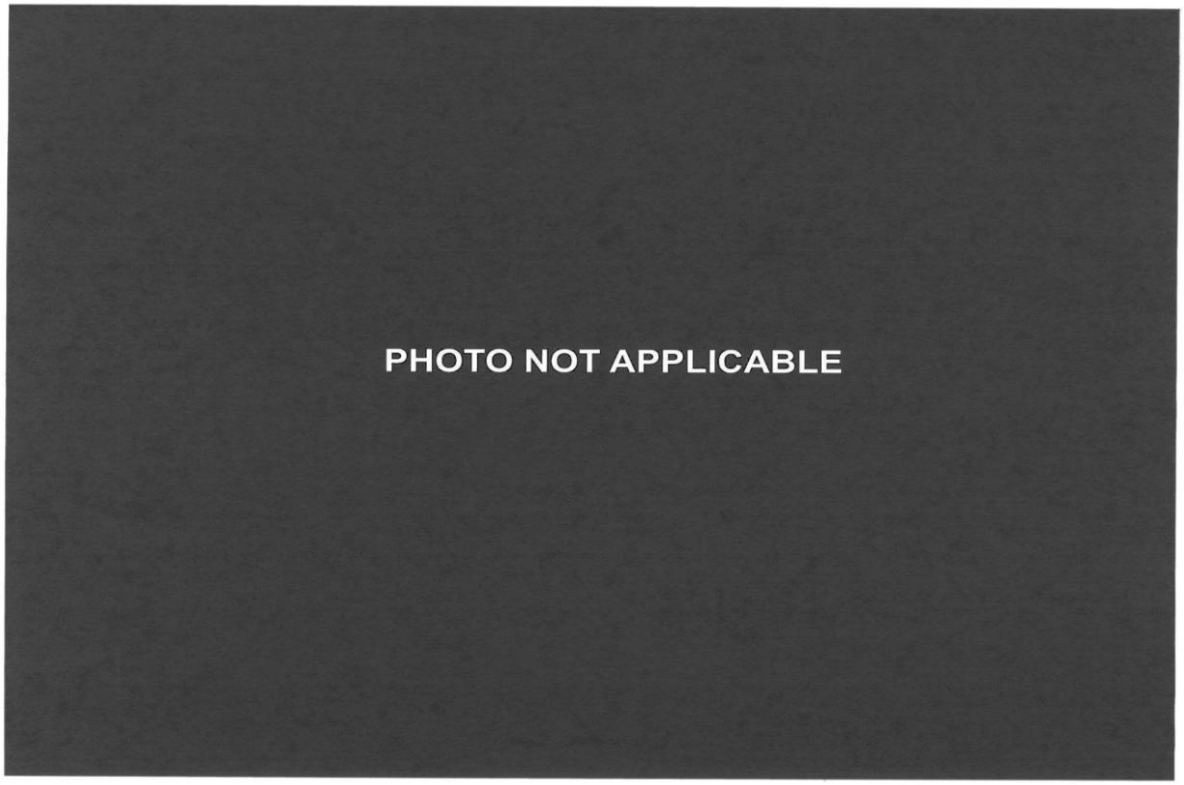
For more information on properly adjusting and positioning the head restraint, refer to "Adjusting Active Head Restraints" in "Understanding The Features Of Your Vehicle".

Resetting Active Head Restraints (AHR)

Parent topic: OCCUPANT RESTRAINTS

Related information +/-

103 Driver Head Restraint Use and Adjustment Information from Vehicle Owner Manual



104 Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

The following additional data can be obtained from the Research and Development section of the NHTSA website (http://www.nhtsa.dot.gov)

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

NHTSA

Test Date: 10/17/2012

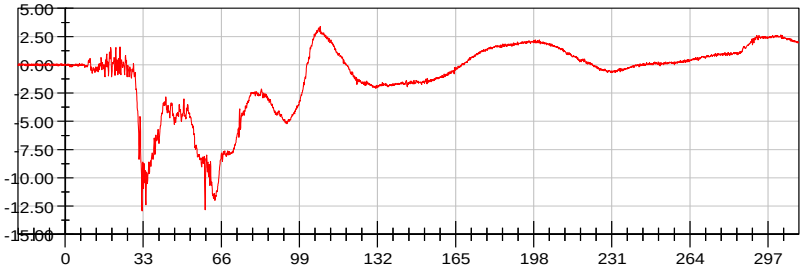
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Driver Head Acceleration (X) Primary vs. Time (g) vs. Time [ms]



<Max>

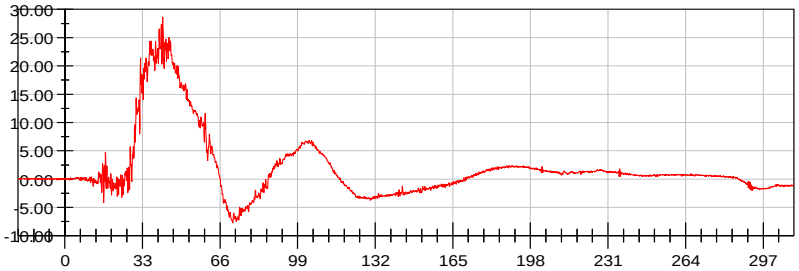
3.41 g at 107.76 ms

<Min>

-12.95 g at 32.48 ms

CFC_1000

Driver Head Acceleration (Y) Primary vs. Time (g) vs. Time [ms]



<Max>

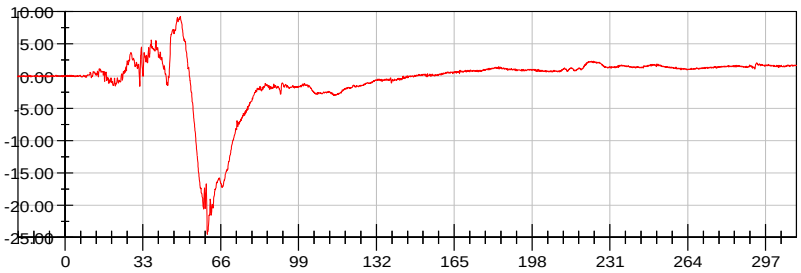
28.61 g at 41.60 ms

<Min>

-7.78 g at 71.44 ms

CFC_1000

Driver Head Acceleration (Z) Primary vs. Time (g) vs. Time [ms]



<Max>

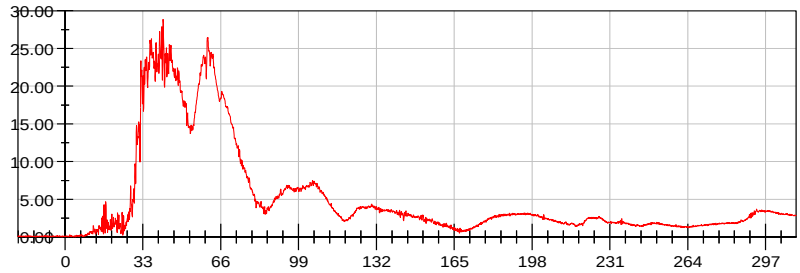
9.26 g at 48.80 ms

<Min>

-24.52 g at 60.32 ms

CFC_1000

Driver Head Resultant Acceleration Primary vs. Time (g) vs. Time [ms]



<Max>

28.85 g at 41.60 ms

<Min>

0.01 g at -18.24 ms

CFC_1000

NHTSA

Test Date: 10/17/2012

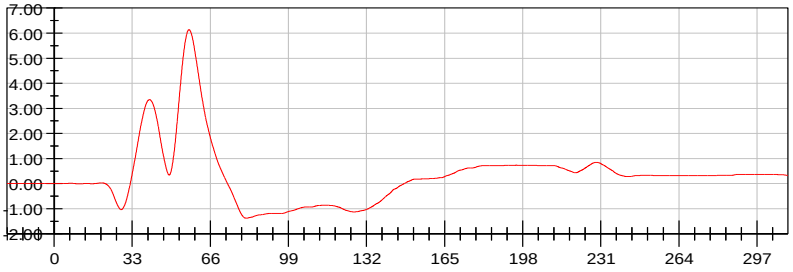
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Driver Upper Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

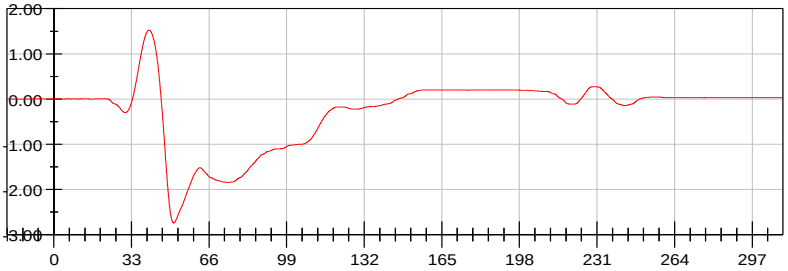
6.14 mm at 56.96 ms

<Min>

-1.38 mm at 81.20 ms

CFC_180

Driver Middle Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

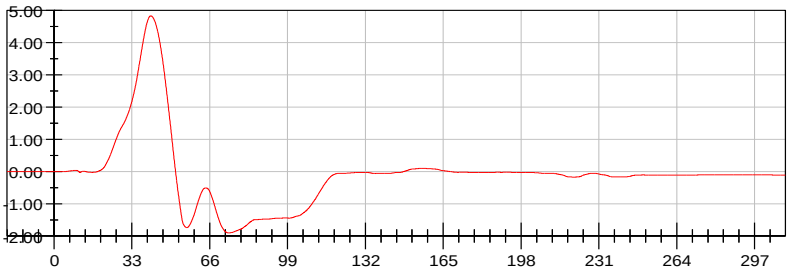
1.52 mm at 40.48 ms

<Min>

-2.75 mm at 50.96 ms

CFC_180

Driver Lower Thorax Rib Deflection (Y) vs. Time (mm) vs. Time [ms]



<Max>

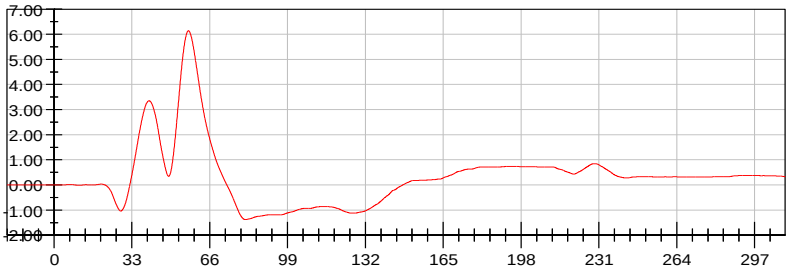
4.83 mm at 41.04 ms

<Min>

-1.90 mm at 74.08 ms

CFC_180

Driver Thorax Rib Deflection Maximum vs. Time (mm) vs. Time [ms]



<Max>

6.14 mm at 56.96 ms

<Min>

-1.38 mm at 81.20 ms

CFC_180

NHTSA

Test Date: 10/17/2012

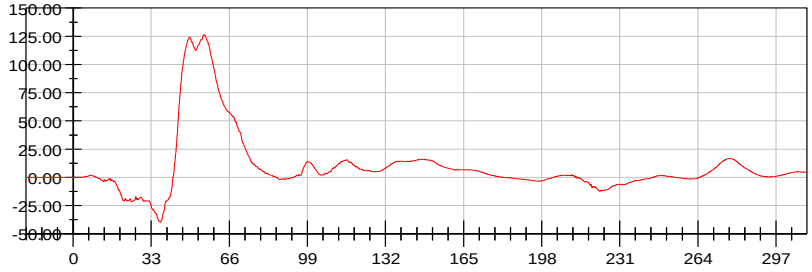
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Driver Anterior Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

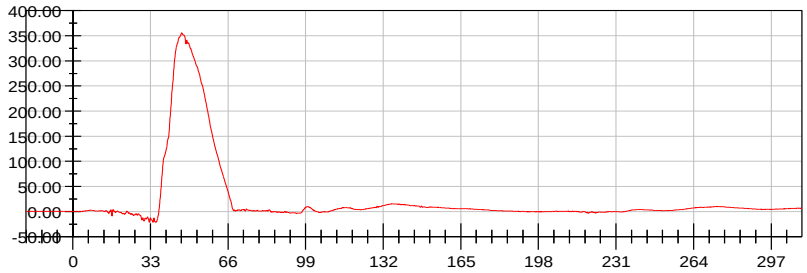
126.25 N at 55.44 ms

<Min>

-39.65 N at 36.88 ms

CFC_600

Driver Middle Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

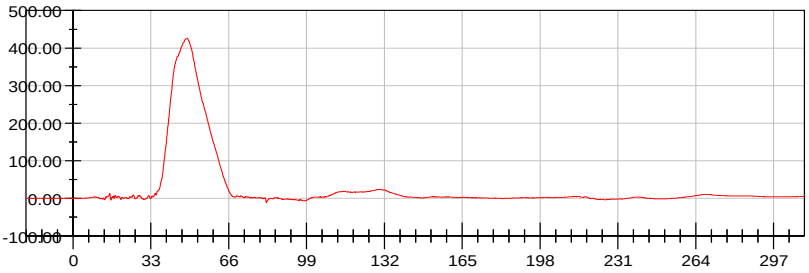
355.69 N at 46.24 ms

<Min>

-21.78 N at 34.08 ms

CFC_600

Driver Posterior Abdominal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

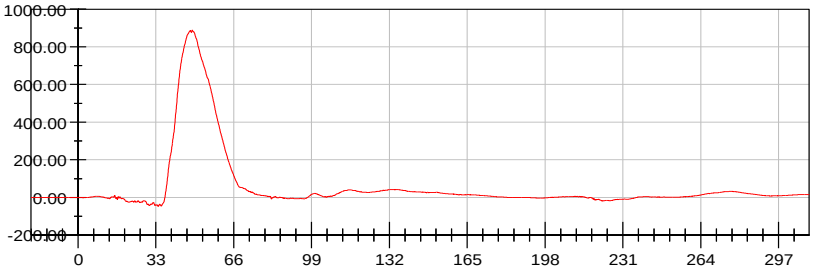
425.92 N at 48.48 ms

<Min>

-11.71 N at 82.08 ms

CFC_600

Driver Total Abdmoninal Force (Y) vs. Time (N) vs. Time [ms]



<Max>

888.88 N at 48.48 ms

<Min>

-46.05 N at 34.00 ms

CFC_600

NHTSA

Test Date: 10/17/2012

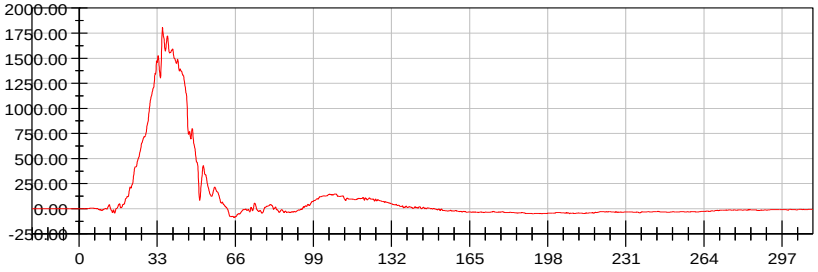
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Driver Pubic Symphysis Force (Y) vs. Time (N) vs. Time [ms]



<Max>

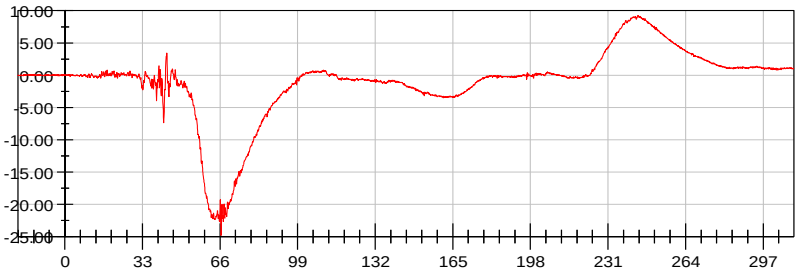
1,804.64 N at 35.20 ms

<Min>

-87.36 N at 65.44 ms

CFC_600

Passenger Head Acceleration (X) Primary vs. Time (g) vs. Time [ms]



<Max>

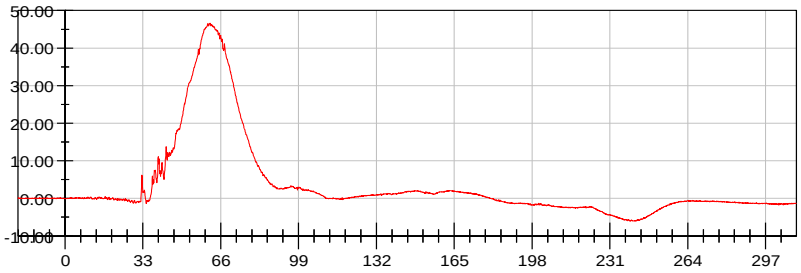
9.26 g at 243.68 ms

<Min>

-24.86 g at 66.48 ms

CFC_1000

Passenger Head Acceleration (Y) Primary vs. Time (g) vs. Time [ms]



<Max>

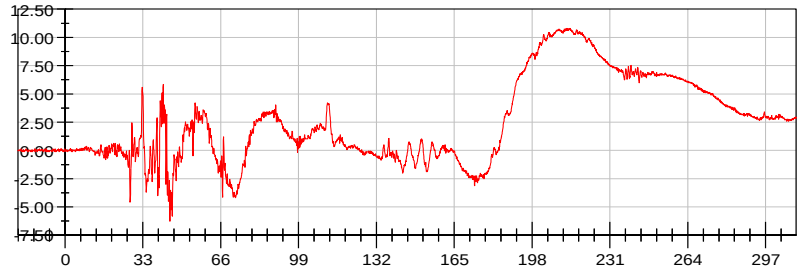
46.60 g at 61.44 ms

<Min>

-6.09 g at 239.60 ms

CFC_1000

Passenger Head Acceleration (Z) Primary vs. Time (g) vs. Time [ms]



<Max>

10.81 g at 212.40 ms

<Min>

-6.27 g at 44.48 ms

CFC_1000

NHTSA

Test Date: 10/17/2012

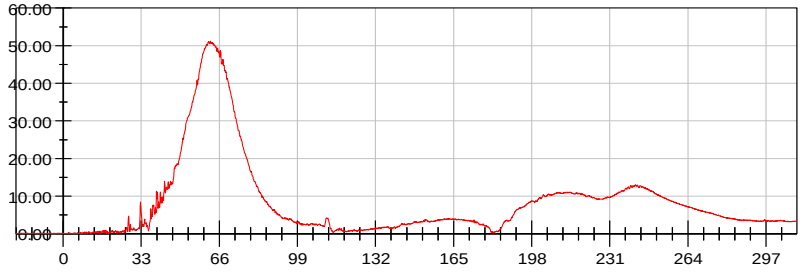
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Passenger Head Resultant Acceleration Primary vs. Time (g) vs. Time [ms]



<Max>

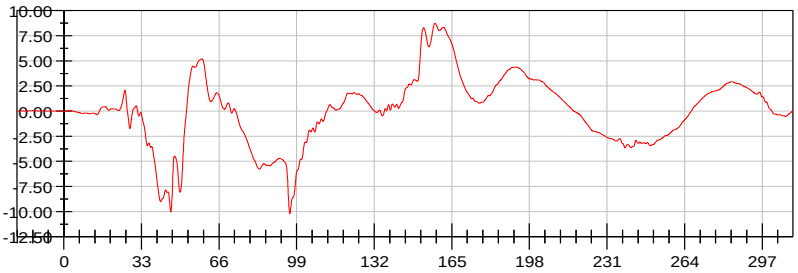
51.20 g at 62.24 ms

<Min>

0.02 g at -19.68 ms

CFC_1000

Passenger Lower Spine T12 Acceleration (X) vs. Time (g) vs. Time [ms]



<Max>

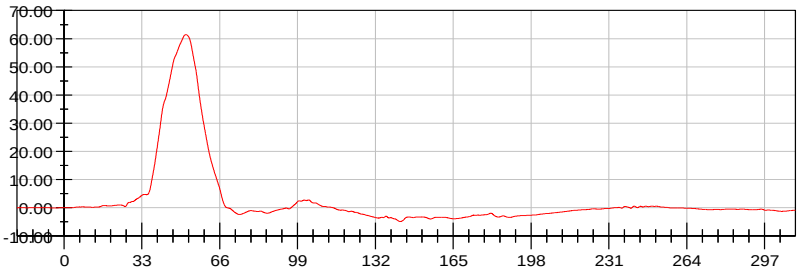
8.74 g at 157.84 ms

<Min>

-10.23 g at 96.08 ms

CFC_180

Passenger Lower Spine T12 Acceleration (Y) vs. Time (g) vs. Time [ms]



<Max>

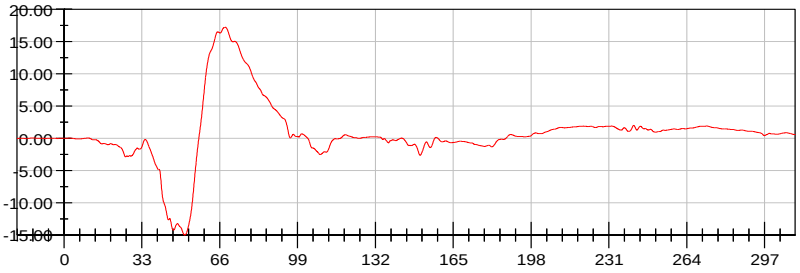
61.43 g at 51.68 ms

<Min>

-4.88 g at 142.56 ms

CFC_180

Passenger Lower Spine T12 Acceleration (Z) vs. Time (g) vs. Time [ms]



<Max>

17.19 g at 68.48 ms

<Min>

-14.96 g at 51.20 ms

CFC_180

NHTSA

Test Date: 10/17/2012

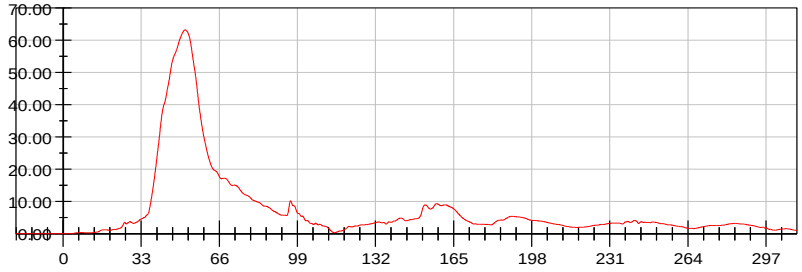
Test Lab: CTF

Position #1 ES-2 Dummy with Rib Extension (030)

Test Number: 121016 (MD0312)

Position #4 SID IIs Dummy (305)

Passenger Lower Spine T12 Resultant Acceleration vs. Time (g) vs. Time [ms]



<Max>

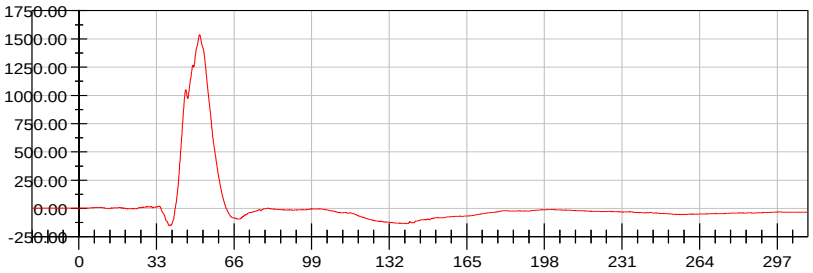
63.21 g at 51.60 ms

<Min>

0.01 g at -1.76 ms

CFC_180

Passenger Iliac Force on Impact Side (Y) vs. Time (N) vs. Time [ms]



<Max>

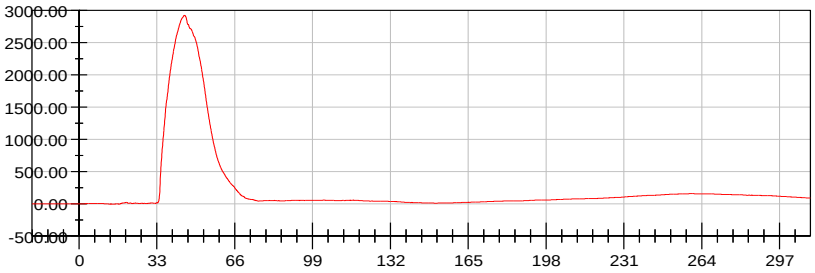
1,536.77 N at 51.36 ms

<Min>

-154.14 N at 38.40 ms

CFC_600

Passenger Acetabulum Force on Impact Side (Y) vs. Time (N) vs. Time [ms]



<Max>

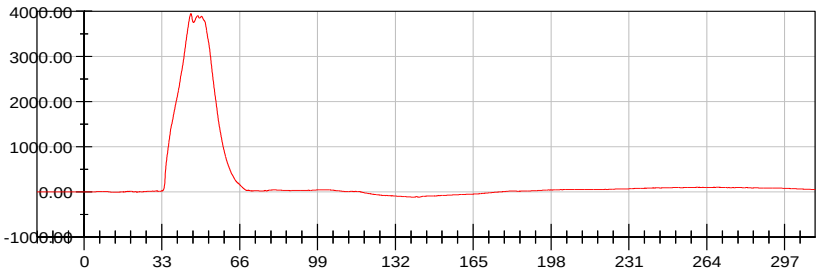
2,923.49 N at 44.72 ms

<Min>

-7.10 N at 14.80 ms

CFC_600

Passenger Total Pelvic Force on Impact Side (Y) vs. Time (N) vs. Time [ms]



<Max>

3,942.01 N at 45.36 ms

<Min>

-115.05 N at 140.08 ms

CFC_600

APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

ES-2re (Driver) Dummy

Description

TABLE OF CALIBRATION MEASUREMENTS AND PLOTS

SID-IIs (Rear Passenger) Dummy

Description

Pre-Test Calibration Sheets
Driver S/N F030

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 08
Date: 10/09/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	911	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	447	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	268	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Resultant Acceleration	125 - 155 g	154.6 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	8.2 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

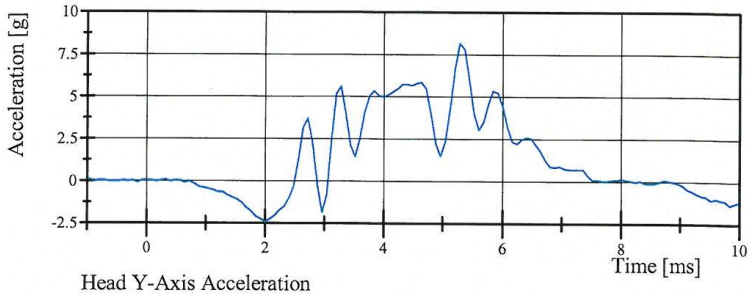
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:45:55 353

Transportation Research Center Inc.

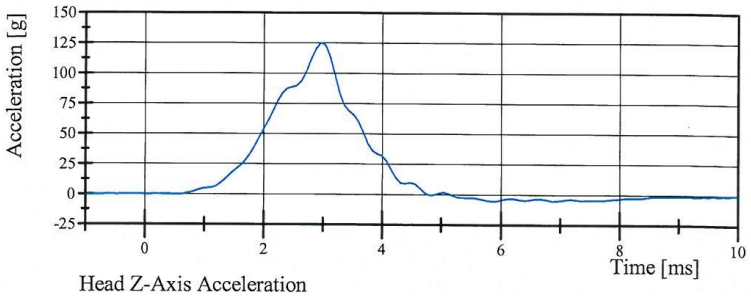
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Head X-Axis Acceleration



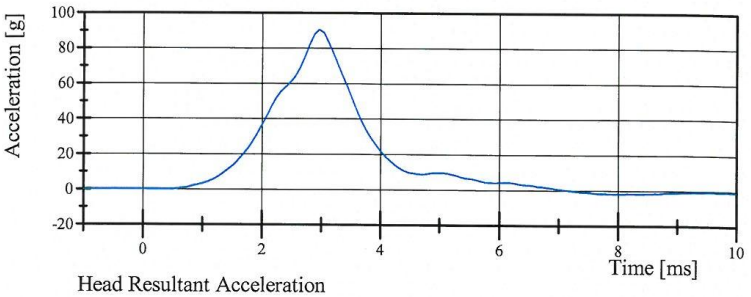
Filter Class: CFC_1000
Max: 8.2 gn at 5.3 ms
Min: -2.4 gn at 2.0 ms

Head Y-Axis Acceleration



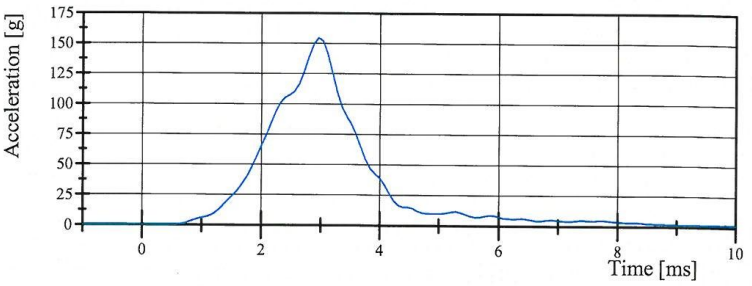
Filter Class: CFC_1000
Max: 125.3 gn at 3.0 ms
Min: -5.2 gn at 5.8 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 90.6 gn at 3.0 ms
Min: -2.0 gn at 8.1 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 154.6 gn at 3.0 ms
Min: 0.0 gn at -0.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:46:02 353

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-54.1 deg	Yes
Time of Peak	54 - 66 ms	58.5 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	66.2 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

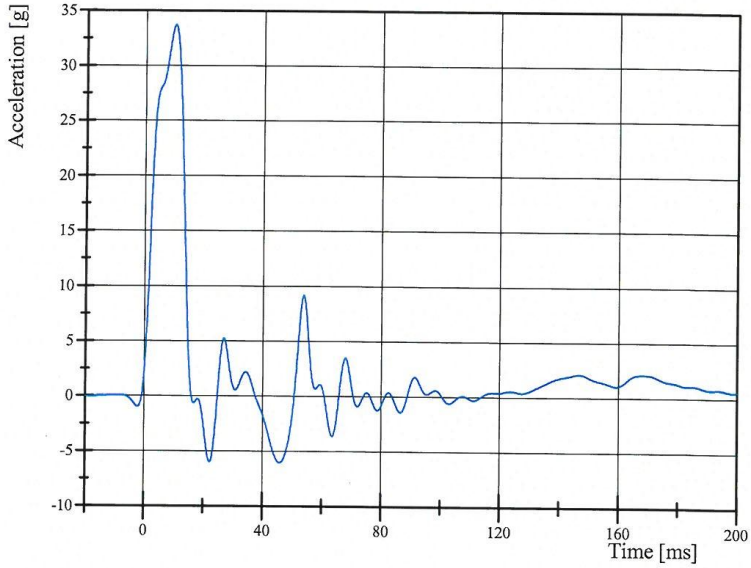
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:47 1312

Transportation Research Center Inc.

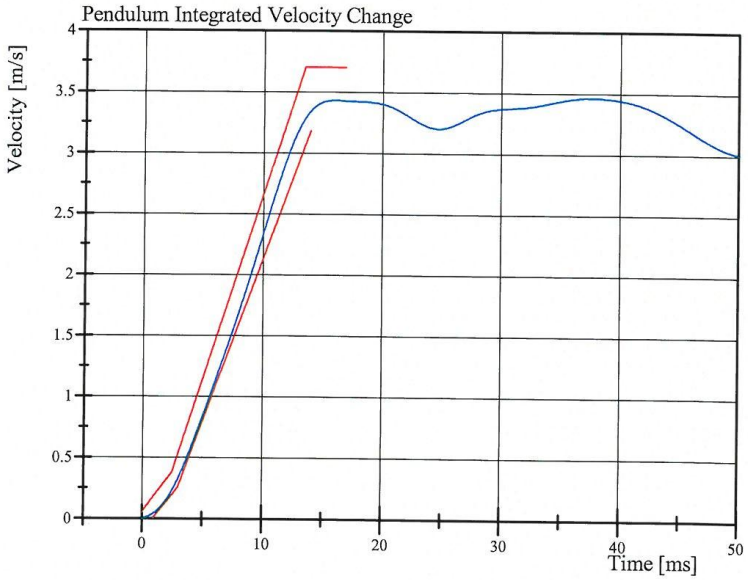
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Pendulum Acceleration



Filter Class: CFC_60
Max: 33.7 gn at 10.0 ms
Min: -6.0 gn at 45.8 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.5 m/s at 37.5 ms
Min: 0.0 m/s at 0.0 ms

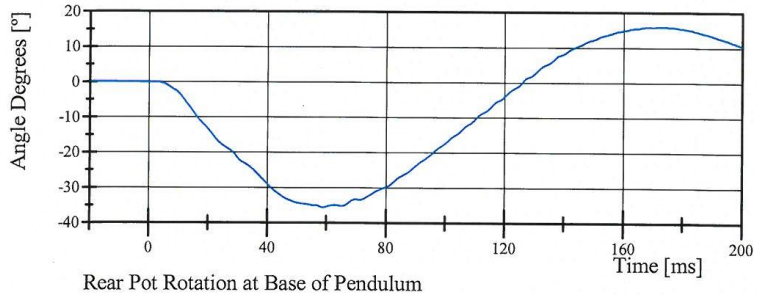
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:54 1312

Transportation Research Center Inc.

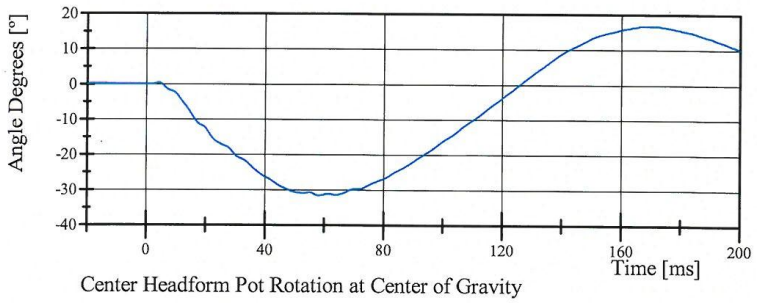
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Forward Pot Rotation at Base of Pendulum



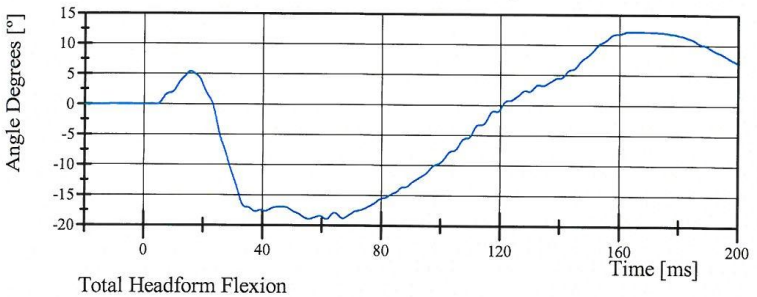
Filter Class: CFC_180
Max: 15.9 ° at 172.9 ms
Min: -35.6 ° at 58.9 ms

Rear Pot Rotation at Base of Pendulum



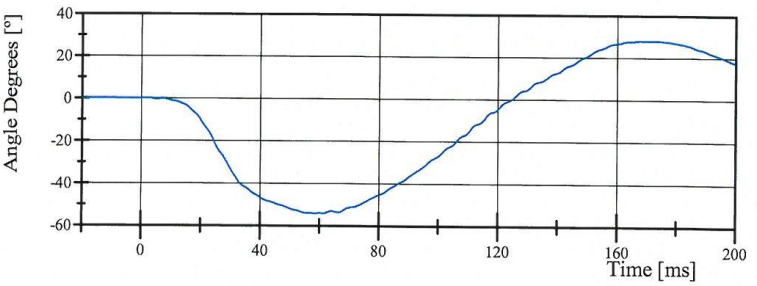
Filter Class: CFC_180
Max: 16.7 ° at 168.5 ms
Min: -31.6 ° at 58.2 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 12.2 ° at 163.5 ms
Min: -19.0 ° at 61.5 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 28.1 ° at 168.4 ms
Min: -54.1 ° at 58.5 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 08:43:55 1312

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.67 g	Yes

Test meets specifications.

Comments:

Technician

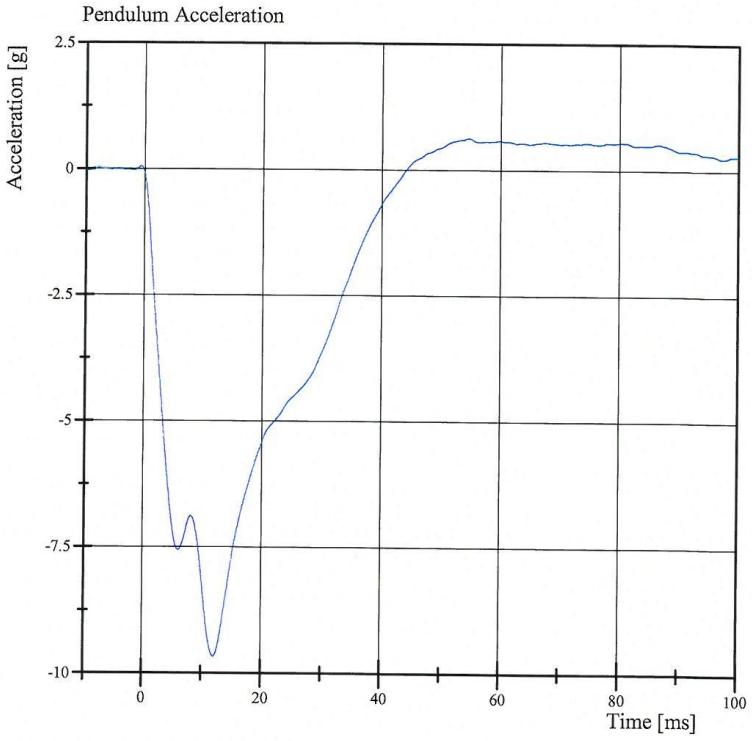
Approved

Specification Source: NHTSA final rule 8/15/2008

10.09.2012 15:03:27 563

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 0.6 gn at 54.6 ms
Min: -9.7 gn at 12.1 ms

Specification Source: NHTSA final rule 8/15/2008

10.09.2012 15:03:34 563

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

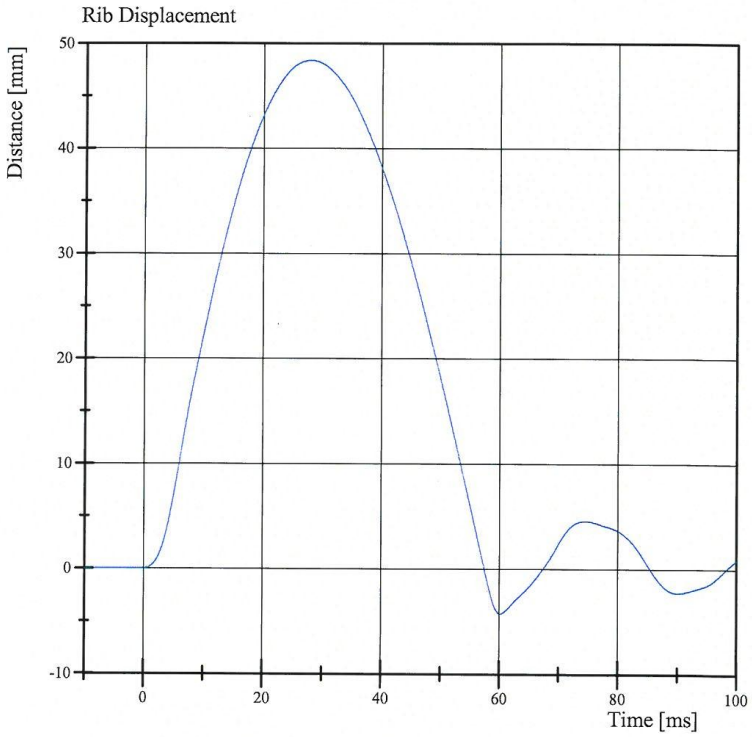
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:53:15 724

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 48.4 mm at 27.9 ms
Min: -4.3 mm at 60.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:53:24 724

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

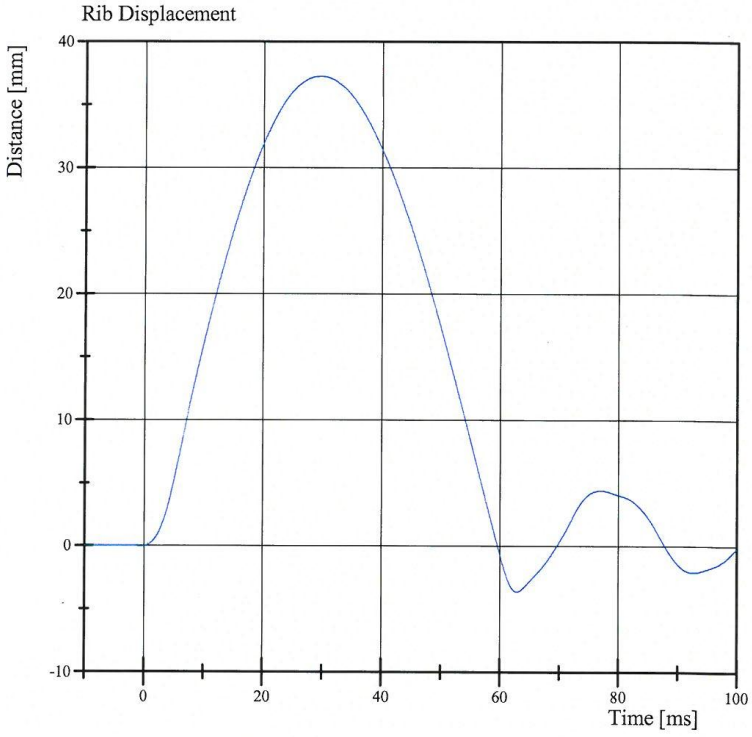
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:59:44 932

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 37.2 mm at 29.6 ms
Min: -3.6 mm at 62.9 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 13:59:52 932

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.1 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

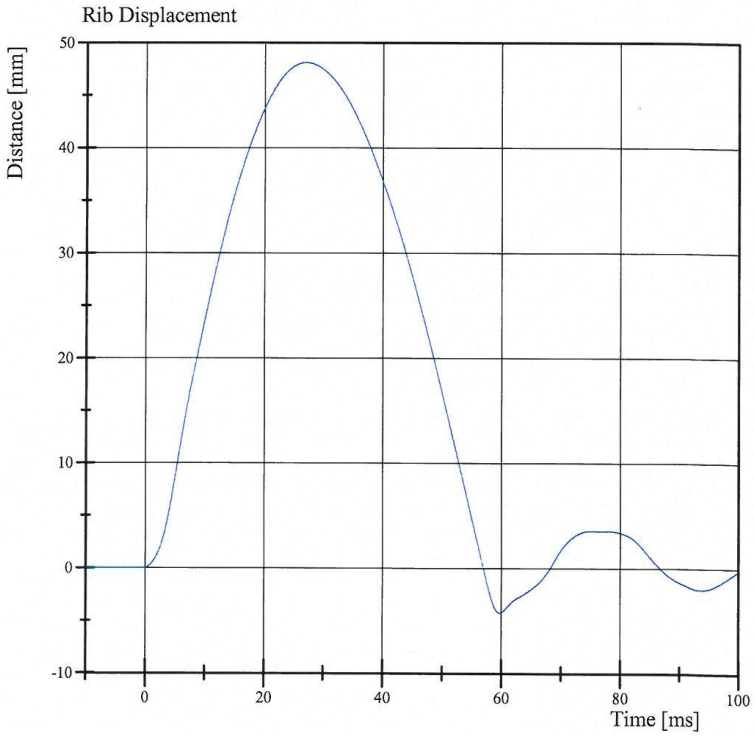
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:04:23 732

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 48.1 mm at 27.0 ms
Min: -4.2 mm at 59.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:04:31 732

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.8 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

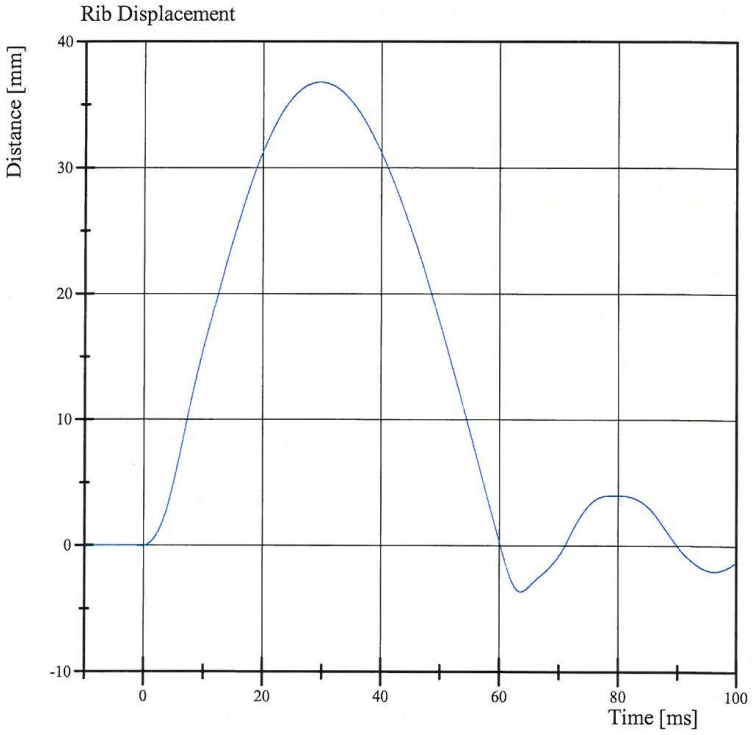
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:11:01 929

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 36.8 mm at 29.7 ms
Min: -3.6 mm at 63.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:11:10 929

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.0 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

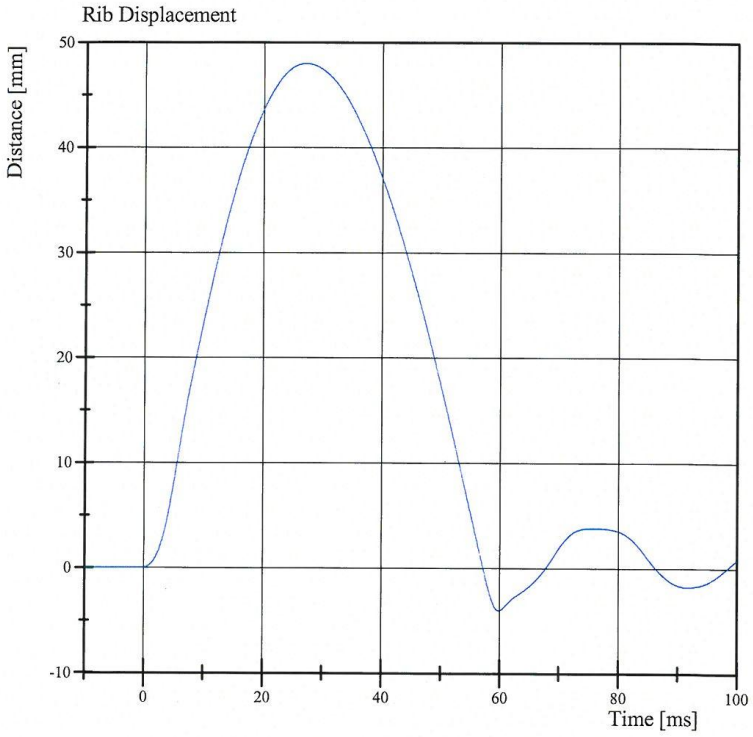
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:15:19 737

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 48.0 mm at 27.1 ms
Min: -4.0 mm at 59.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:15:26 737

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

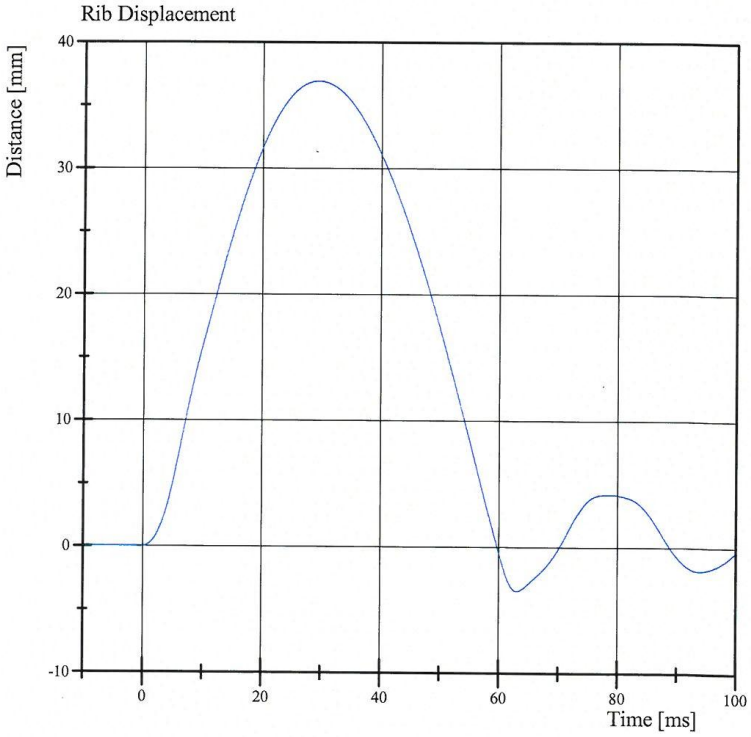
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:20:51 923

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 36.9 mm at 29.4 ms
Min: -3.5 mm at 63.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 14:21:02 923

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.479 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,467.5 N	Yes
Upper Rib Displacement	34 - 41 mm	37.1 mm	Yes
Center Rib Displacement	37 - 45 mm	40.0 mm	Yes
Lower Rib Displacement	37 - 44 mm	40.8 mm	Yes

Test meets specifications.

Comments:

Technician

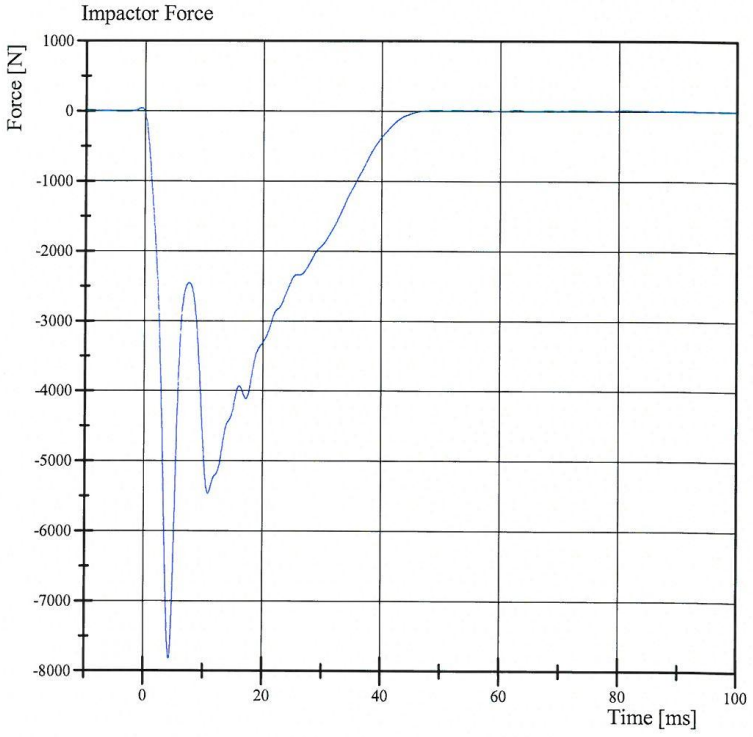
Approved

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:21 443

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012



Filter Class: CFC_180
Max: 37.4 N at -0.6 ms
Min: -7,828.7 N at 4.3 ms

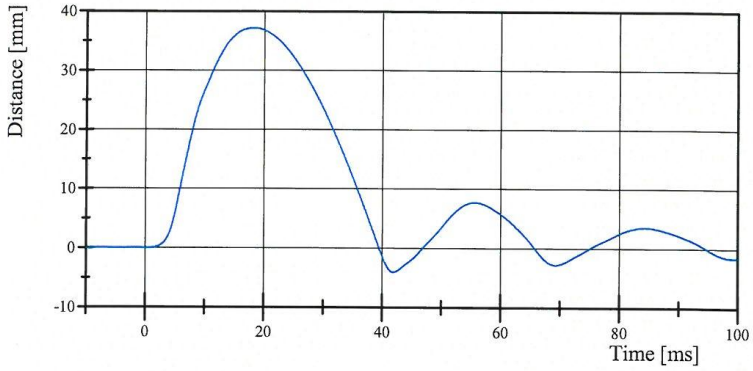
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:28 443

Transportation Research Center Inc.

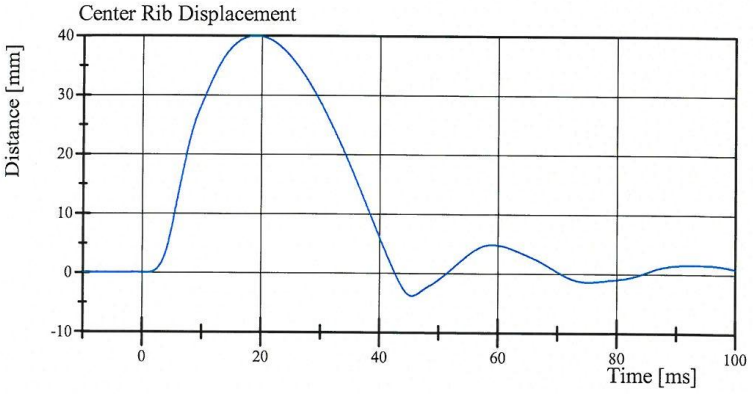
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Upper Rib Displacement



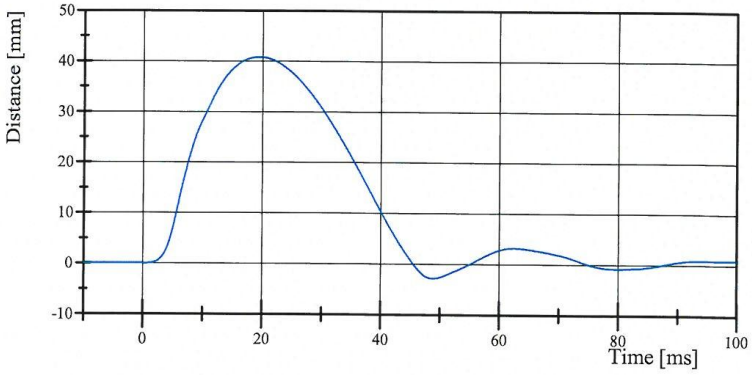
Filter Class: CFC_180
Max: 37.1 mm at 18.2 ms
Min: -4.0 mm at 41.9 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.0 mm at 19.0 ms
Min: -3.8 mm at 45.5 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 40.8 mm at 19.5 ms
Min: -2.8 mm at 48.9 ms

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.09.2012 15:10:29 443

Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,022.3 N	Yes
Time of Peak	10.6 - 13.0 ms	11.28 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,575.6 N	Yes
Time of Peak	10.0 - 12.3 ms	10.16 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

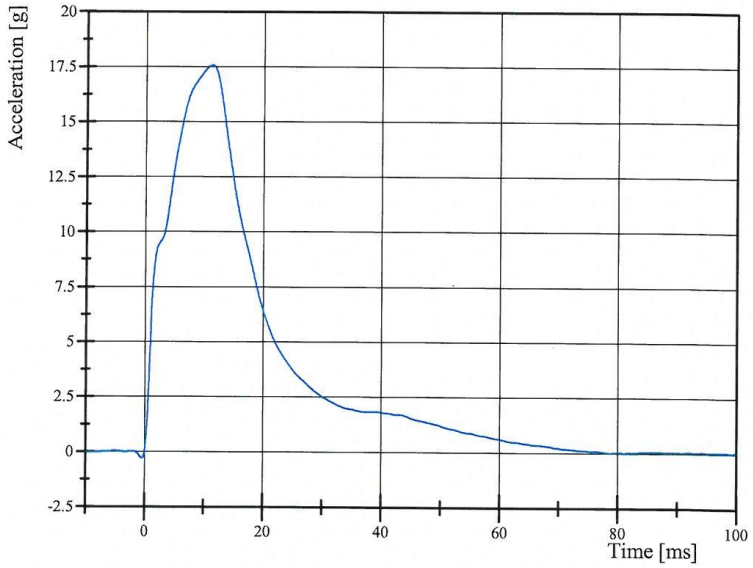
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:14 616

Transportation Research Center Inc.

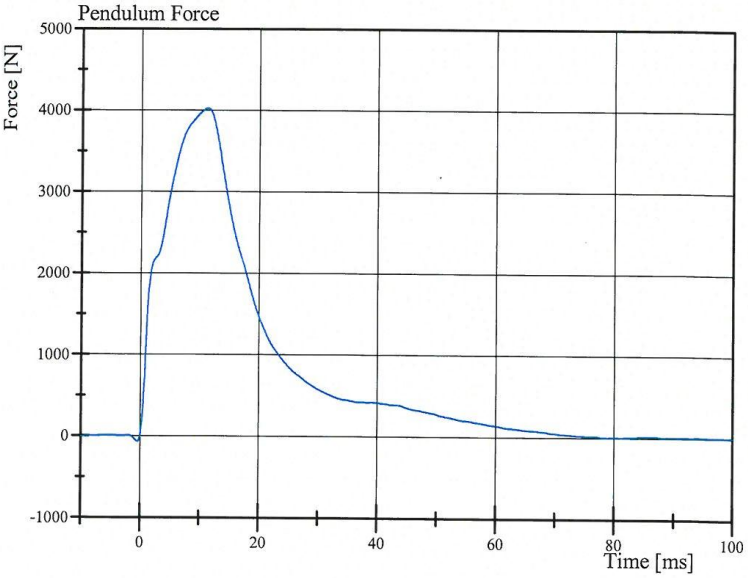
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 17.6 gn at 11.3 ms
Min: -0.3 gn at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,022.3 N at 11.3 ms
Min: -68.6 N at -0.5 ms

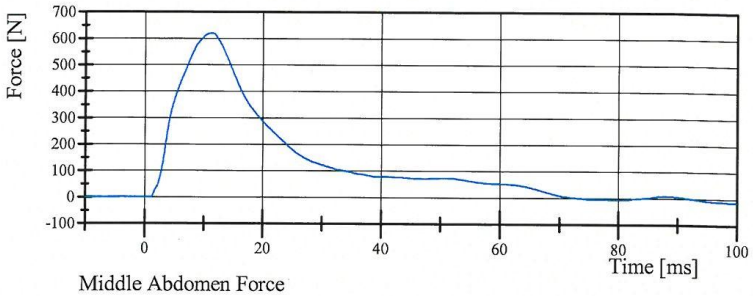
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:21 616

Transportation Research Center Inc.

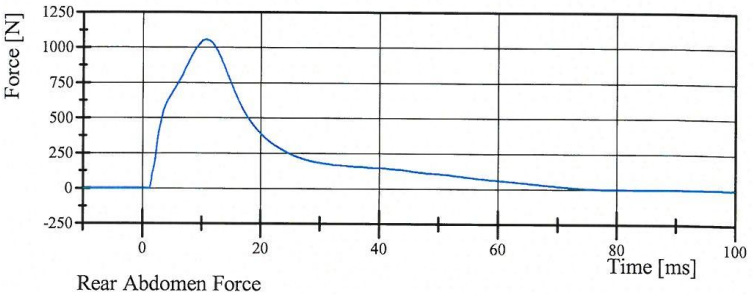
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Front Abdomen Force



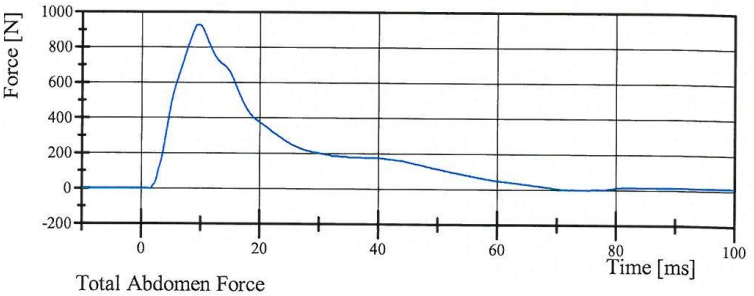
Filter Class: CFC_600
Max: 619.1 N at 11.4 ms
Min: -12.4 N at 99.5 ms

Middle Abdomen Force



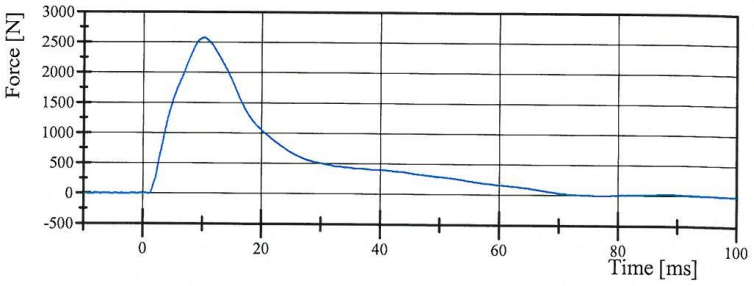
Filter Class: CFC_600
Max: 1,054.9 N at 10.6 ms
Min: -2.9 N at 1.0 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 925.9 N at 9.5 ms
Min: -2.6 N at 1.5 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,575.6 N at 10.2 ms
Min: -3.5 N at 1.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:19:22 616

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.22 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	4,875.7 N	Yes
Time of Peak	11.8 - 16.1 ms	13.52 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,317.9 N	Yes
Time of Peak	12.2 - 17.0 ms	13.36 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

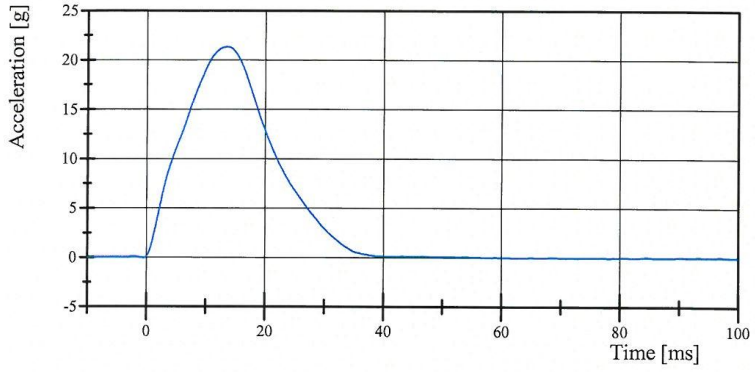
Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:35:19 561

Transportation Research Center Inc.

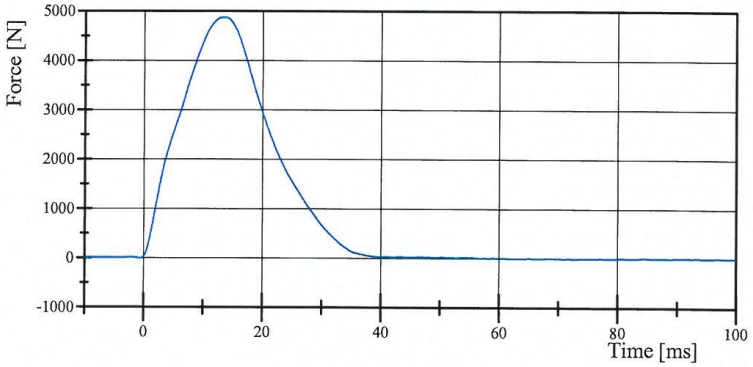
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 8-1
Test Date: 10/9/2012

Pendulum Acceleration



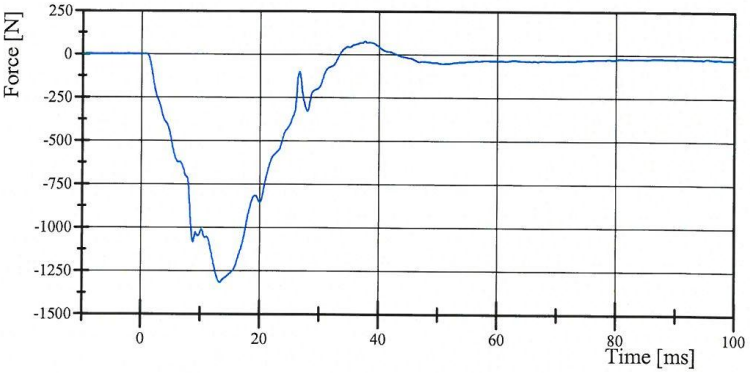
Filter Class: CFC_180
Max: 21.3 gn at 13.5 ms
Min: -0.1 gn at -0.6 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,875.7 N at 13.5 ms
Min: -12.3 N at -0.6 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 76.9 N at 37.6 ms
Min: -1,317.9 N at 13.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.09.2012 15:35:26 561

Driver S/N F030

Post-Test Calibration Sheets

Transportation Research Center Inc.
572U ES-2re Dummy
External Dimensions
Serial No. F030 Calibration No. 09
Date: 10/17/12

Symbol	Description	Specification	Results	Pass
		mm	mm	
1	Sitting Height	900.0 - 918.0	910	Yes
2	Seat to Shoulder Joint	558.0 - 572.0	560	Yes
3	Seat to Lower Face of Thoracic Spine Box	346.0 - 356.0	350	Yes
4	Seat to Hip Joint (center of bolt)	97.0 - 103.0	98	Yes
5	Sole to Seat, Sitting	433.0 - 451.0	448	Yes
6	Head Width	152.0 - 158.0	155	Yes
7	Shoulder/Arm Width	461.0 - 479.0	472	Yes
8	Thorax Width	322.0 - 332.0	325	Yes
9	Abdomen Width	273.0 - 287.0	282	Yes
10	Pelvis Lap Width	359.0 - 373.0	367	Yes
11	Head Depth	196.0 - 206.0	200	Yes
12	Thorax Depth	262.0 - 272.0	268	Yes
13	Abdomen Depth	194.0 - 204.0	200	Yes
14	Pelvis Depth	235.0 - 245.0	240	Yes
15	Back of Buttocks to Hip Joint (center of bolt)	150.0 - 160.0	159	Yes
16	Back of Buttocks to Front of Knee	597.0 - 615.0	604	Yes

Technician

Approved

Baseline 10/07/05

Transportation Research Center Inc.

Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	125 - 155 g	134.4 g	Yes
Peak Longitudinal Acceleration	(-15) - 15 g	6.4 g	Yes
Is Resultant Acceleration Curve Unimodal within 15% of Main Pulse?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

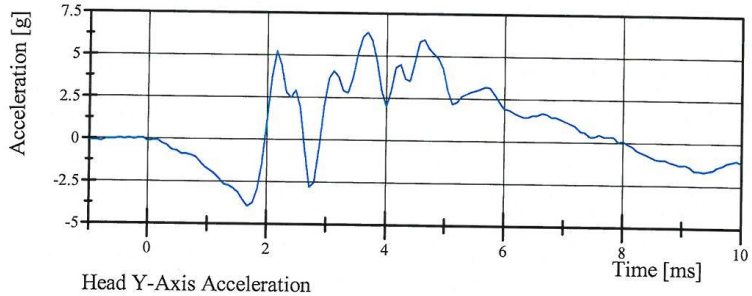
Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 09:15:23 359

Transportation Research Center Inc.

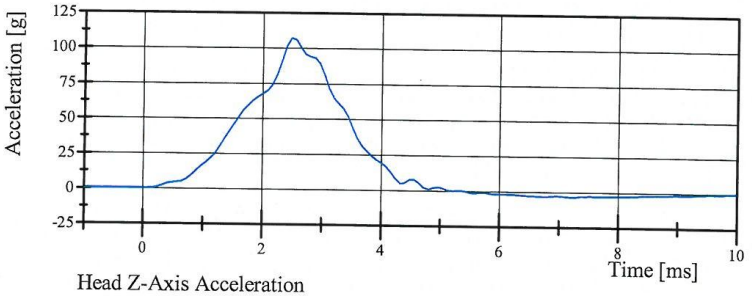
Left Lateral Head Drop
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Head X-Axis Acceleration



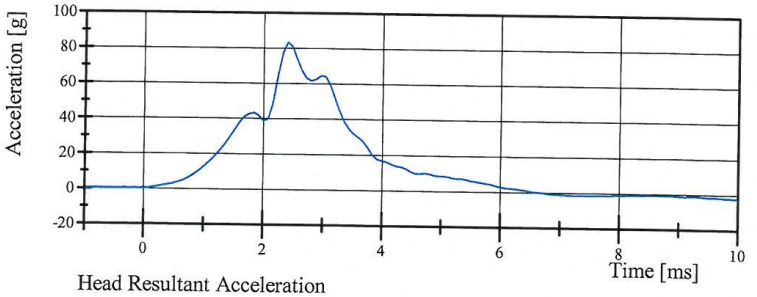
Filter Class: CFC_1000
Max: 6.4 gn at 3.7 ms
Min: -4.0 gn at 1.7 ms

Head Y-Axis Acceleration



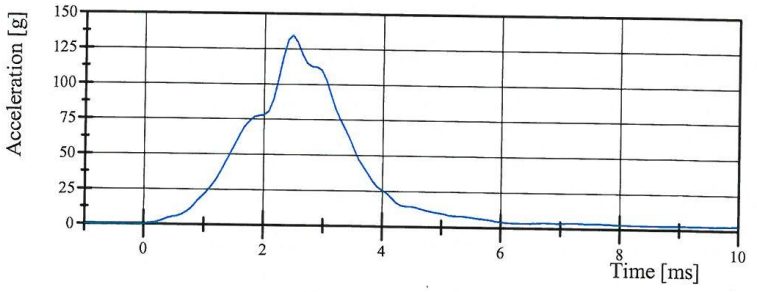
Filter Class: CFC_1000
Max: 107.2 gn at 2.5 ms
Min: -3.4 gn at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 83.3 gn at 2.4 ms
Min: -2.5 gn at 10.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 134.4 gn at 2.5 ms
Min: 0.0 gn at -0.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 09:15:30 359

Transportation Research Center Inc.

Left Lateral Neck
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Integrated Velocity Change within Corridor	Yes	Yes	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.36 m/s	Yes
Maximum Headform Flexion			
Peak	(-49) - (-59) deg	-54.0 deg	Yes
Time of Peak	54 - 66 ms	59.2 ms	Yes
Headform Flexion Decay - Peak to Zero	53 - 88 ms	65.0 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

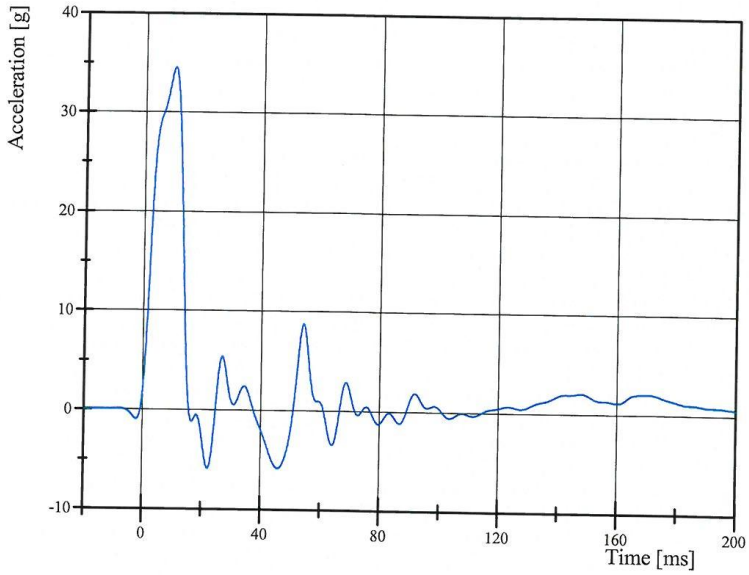
Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 10:27:45 1312

Transportation Research Center Inc.

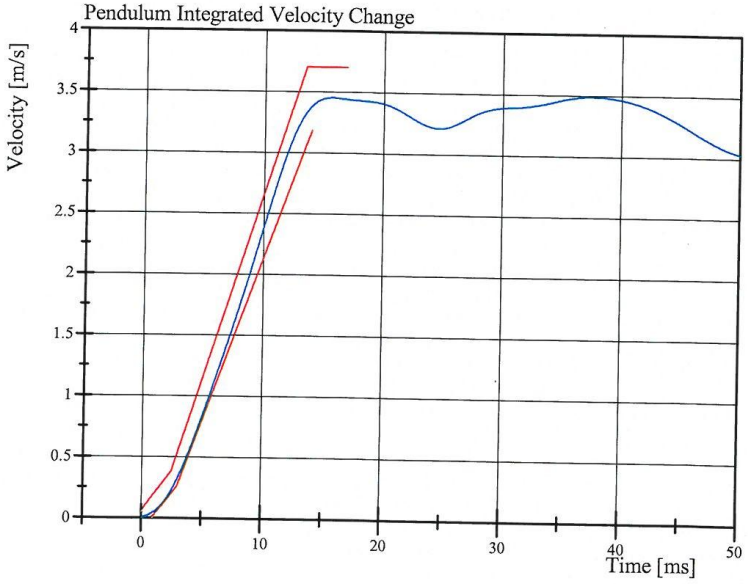
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Pendulum Acceleration



Filter Class: CFC_60
Max: 34.5 gn at 9.9 ms
Min: -5.9 gn at 22.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_60
Max: 3.5 m/s at 37.5 ms
Min: 0.0 m/s at 0.0 ms

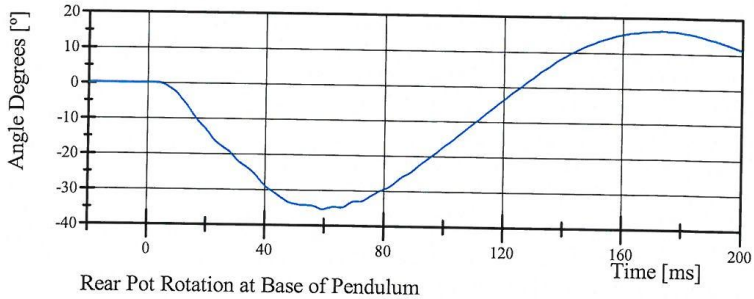
Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 10:27:52 1312

Transportation Research Center Inc.

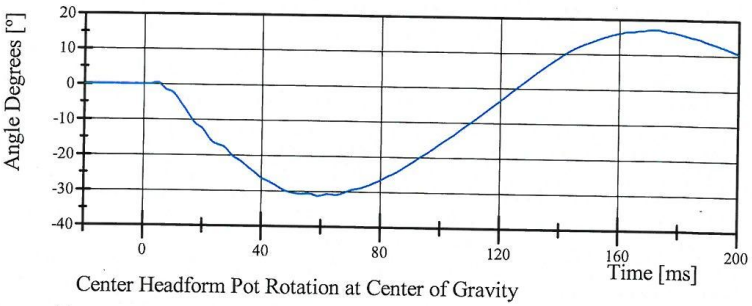
Left Lateral Neck
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Forward Pot Rotation at Base of Pendulum



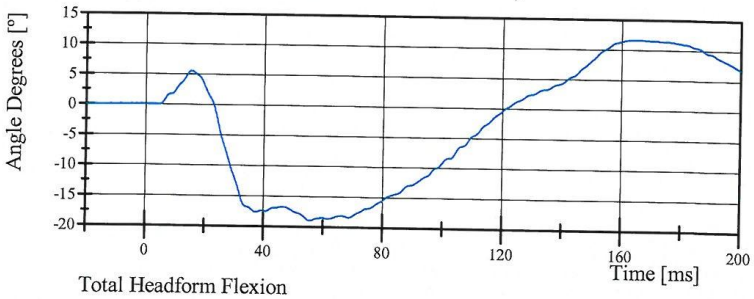
Filter Class: CFC_180
Max: 16.3 ° at 173.9 ms
Min: -35.5 ° at 59.4 ms

Rear Pot Rotation at Base of Pendulum



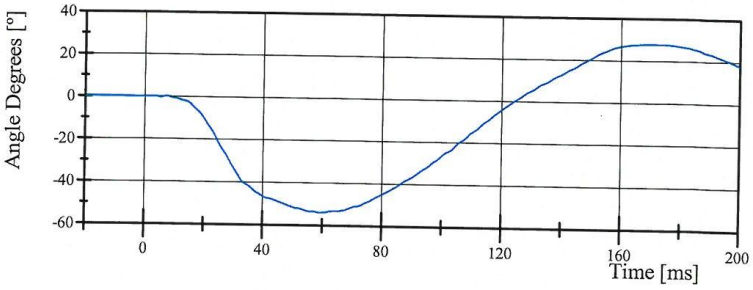
Filter Class: CFC_180
Max: 17.2 ° at 171.7 ms
Min: -31.3 ° at 58.9 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_180
Max: 11.6 ° at 164.7 ms
Min: -19.0 ° at 55.6 ms

Total Headform Flexion



Filter Class: CFC_180
Max: 27.8 ° at 172.7 ms
Min: -54.0 ° at 59.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 10:27:53 1312

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.32 m/s	Yes
Test Probe Acceleration	(-7.5) - (-10.5) g	-9.46 g	Yes

Test meets specifications.

Comments:

Technician

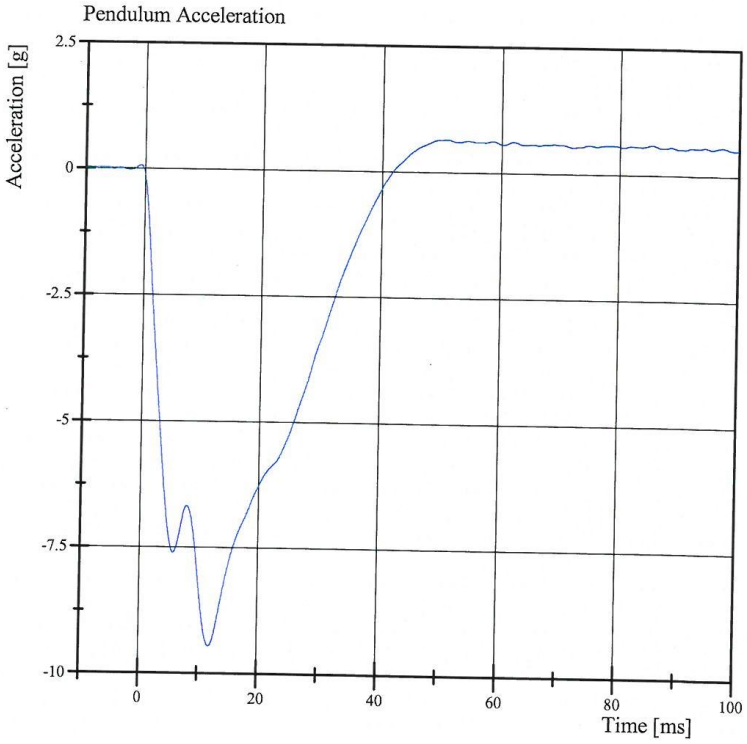
Approved

Specification Source: NHTSA final rule 8/15/2008

10.17.2012 11:13:57 595

Transportation Research Center Inc.

Left Lateral Shoulder
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 0.6 gn at 50.8 ms
Min: -9.5 gn at 11.9 ms

Specification Source: NHTSA final rule 8/15/2008

10.17.2012 11:14:04 595

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.7 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

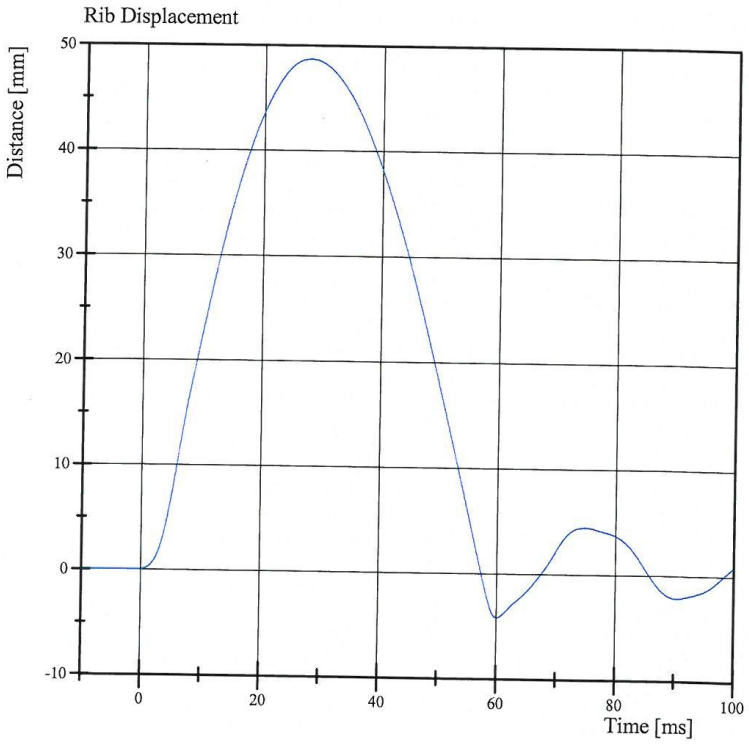
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:05:11 733

Transportation Research Center Inc.

4.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 48.7 mm at 27.8 ms
Min: -4.2 mm at 60.1 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:05:18 733

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

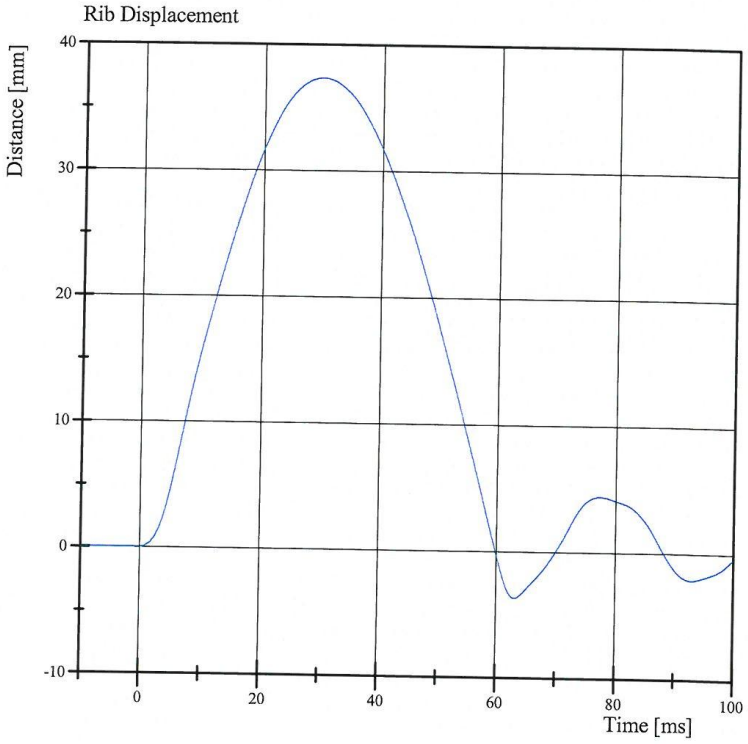
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:10:28 916

Transportation Research Center Inc.

3.0 m/s Upper Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 37.3 mm at 29.8 ms
Min: -3.7 mm at 63.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:10:38 916

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.3 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

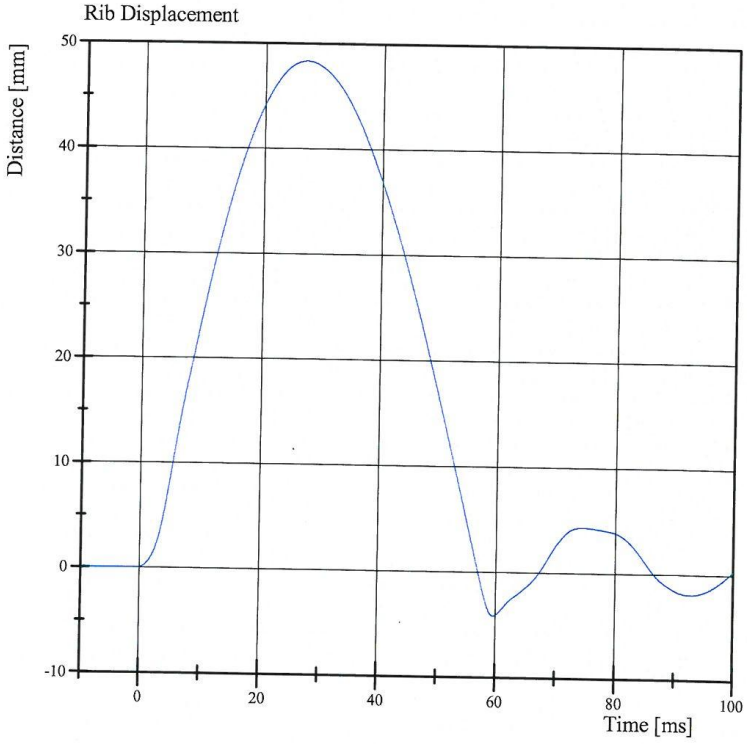
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:17:53 735

Transportation Research Center Inc.

4.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 48.3 mm at 27.0 ms
Min: -4.2 mm at 59.6 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:18:01 735

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	36.9 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

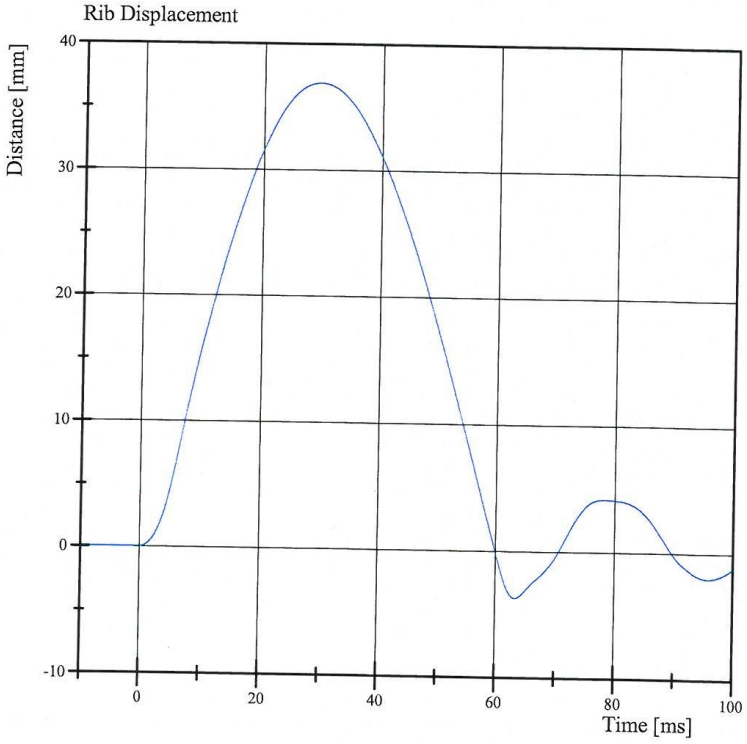
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:24:12 925

Transportation Research Center Inc.

3.0 m/s Center Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 36.9 mm at 29.4 ms
Min: -3.7 mm at 63.4 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:24:19 925

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
4.0 m/s Test Rib Displacement (807 mm to 823 mm)	46 - 51 mm	48.4 mm	Yes

Test meets specifications.

Comments:

Drop Height: 816

Technician

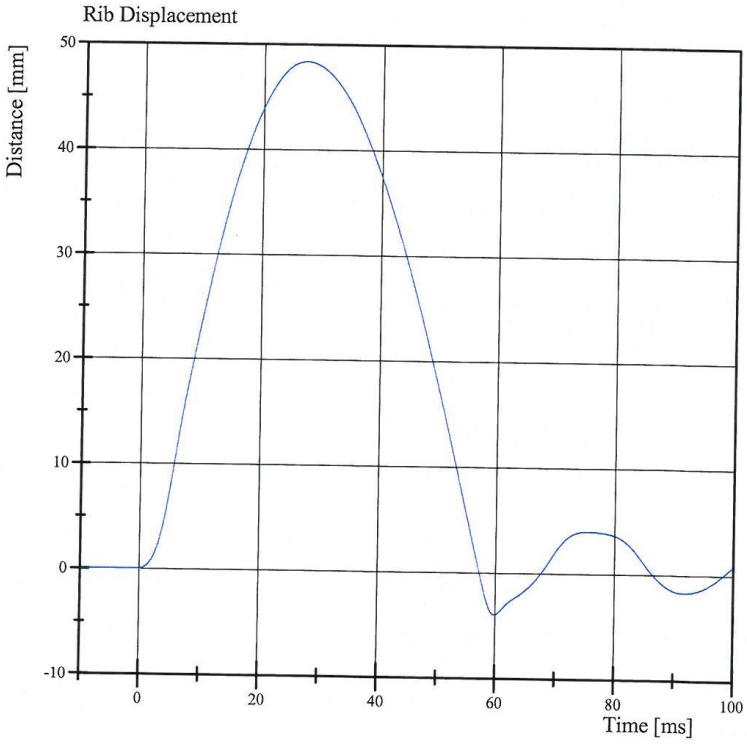
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:28:25 736

Transportation Research Center Inc.

4.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 48.4 mm at 27.1 ms
Min: -4.0 mm at 59.8 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:28:35 736

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
3.0 m/s Test Rib Displacement (454 mm to 464 mm)	36 - 40 mm	37.2 mm	Yes

Test meets specifications.

Comments:

Drop Height: 462

Technician

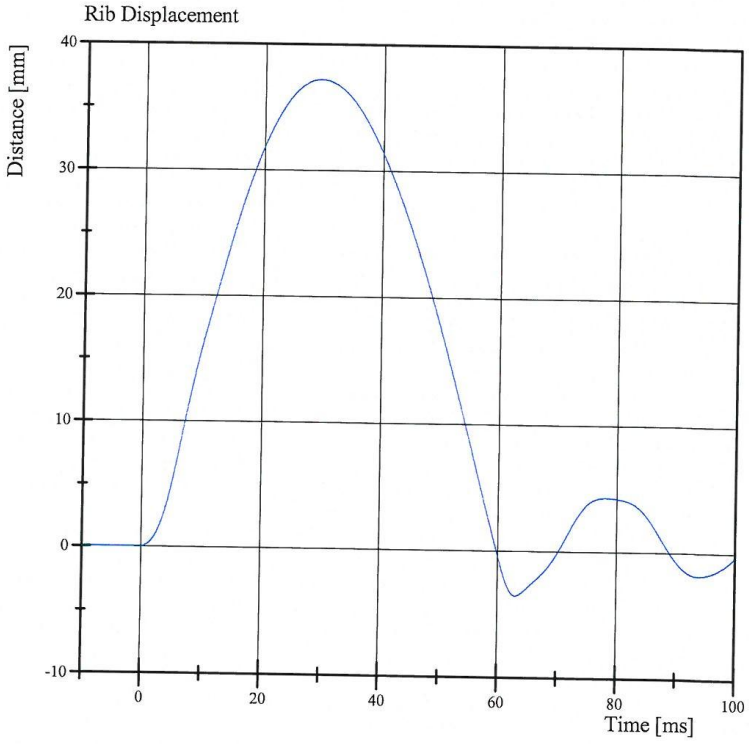
Approved

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:35:34 921

Transportation Research Center Inc.

3.0 m/s Lower Full Rib Module
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 37.2 mm at 29.4 ms
Min: -3.5 mm at 63.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 08:35:43 921

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impactor Velocity	5.4 - 5.60 m/s	5.465 m/s	Yes
Peak Impactor Force after 6 ms	(-5,100) - (-6,200) N	-5,466.9 N	Yes
Upper Rib Displacement	34 - 41 mm	37.4 mm	Yes
Center Rib Displacement	37 - 45 mm	40.7 mm	Yes
Lower Rib Displacement	37 - 44 mm	41.9 mm	Yes

Test meets specifications.

Comments:

Technician

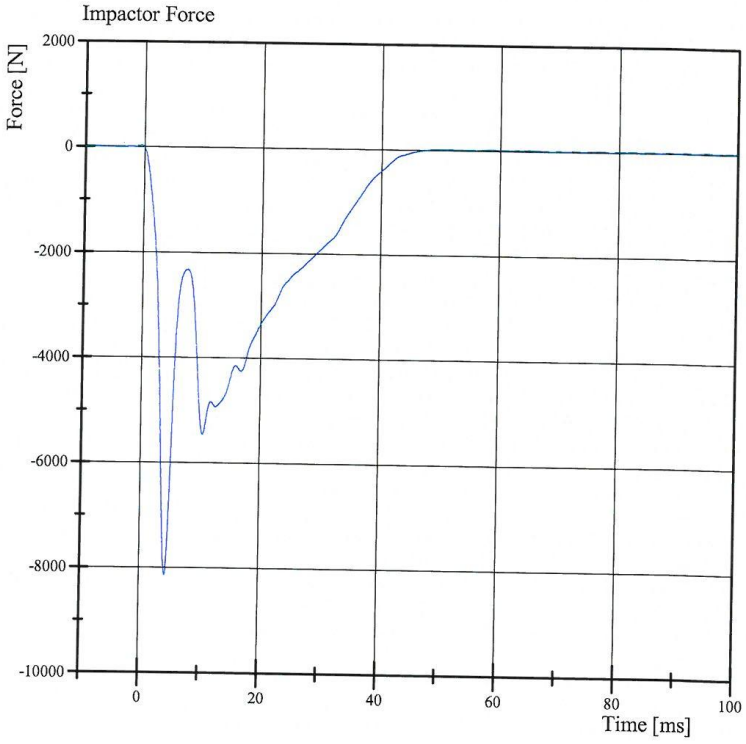
Approved

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.17.2012 11:23:05 482

Transportation Research Center Inc.

Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012



Filter Class: CFC_180
Max: 24.6 N at -0.6 ms
Min: -8,146.9 N at 4.3 ms

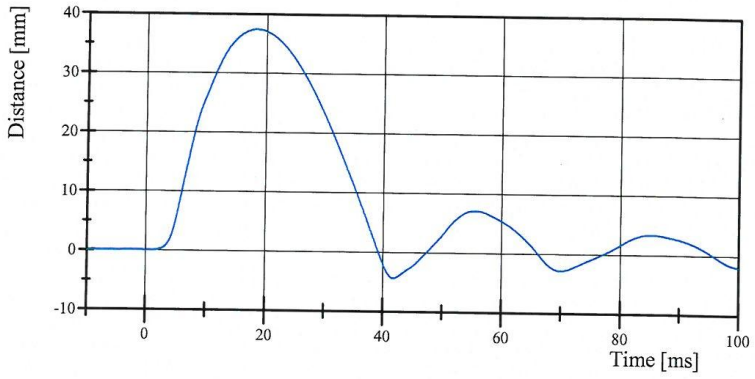
Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

10.17.2012 11:23:12 482

Transportation Research Center Inc.

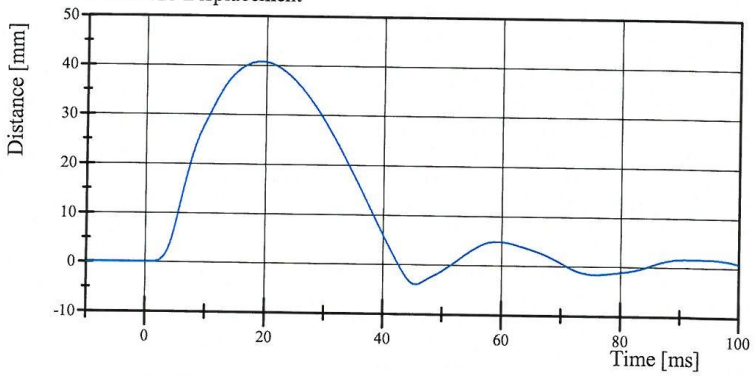
Left Lateral Thorax
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Upper Rib Displacement



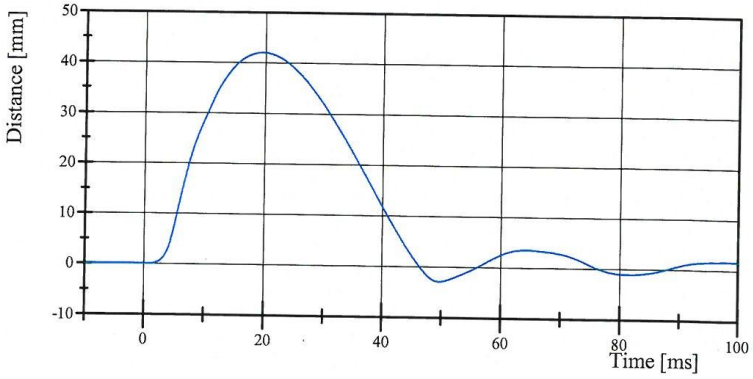
Filter Class: CFC_180
Max: 37.4 mm at 18.3 ms
Min: -4.4 mm at 41.8 ms

Center Rib Displacement



Filter Class: CFC_180
Max: 40.7 mm at 19.1 ms
Min: -4.0 mm at 45.5 ms

Lower Rib Displacement



Filter Class: CFC_180
Max: 41.9 mm at 19.5 ms
Min: -2.9 mm at 49.7 ms

Specification Source: Procedures based on Final Rule dated 8/15/2008.
Polarity in accordance with SAE J211.

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Transportation Research Center Inc.

Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Test Probe Velocity	3.9 - 4.1 m/s	3.93 m/s	Yes
Test Probe Force			
Peak	4,000 - 4,800 N	4,057.6 N	Yes
Time of Peak	10.6 - 13.0 ms	11.52 ms	Yes
Total Abdominal Force			
Peak	2,200 - 2,700 N	2,467.1 N	Yes
Time of Peak	10.0 - 12.3 ms	10.32 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

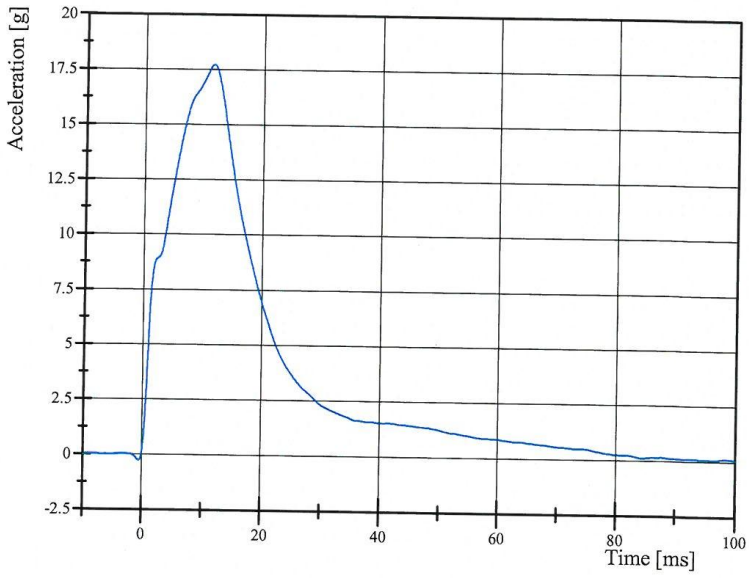
Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 11:36:04 536

Transportation Research Center Inc.

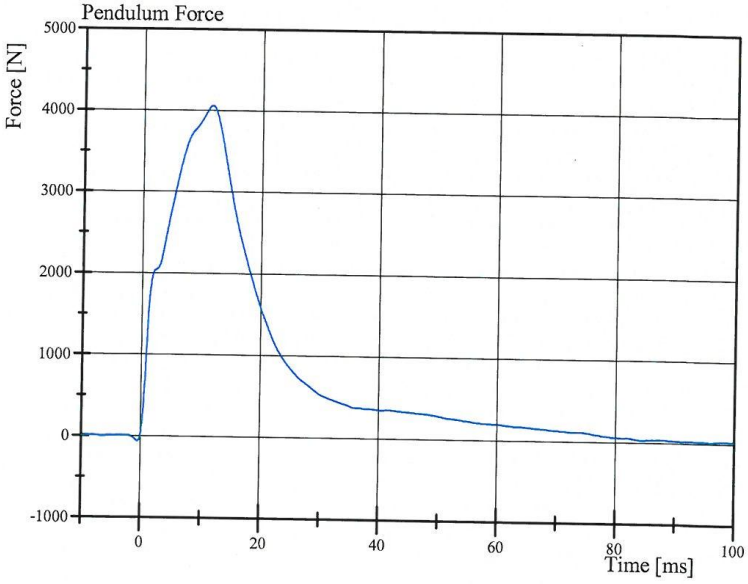
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 17.7 gn at 11.5 ms
Min: -0.3 gn at -0.5 ms

Pendulum Force



Filter Class: CFC_180
Max: 4,057.6 N at 11.5 ms
Min: -65.9 N at -0.5 ms

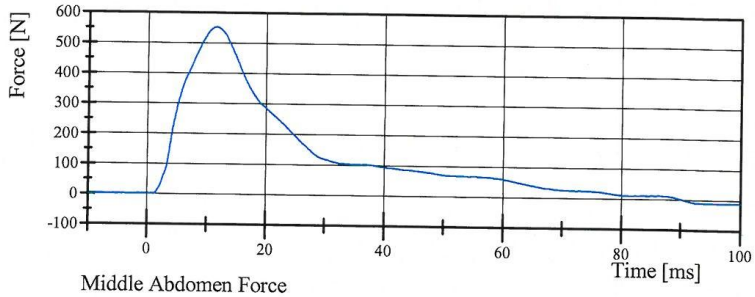
Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 11:36:15 536

Transportation Research Center Inc.

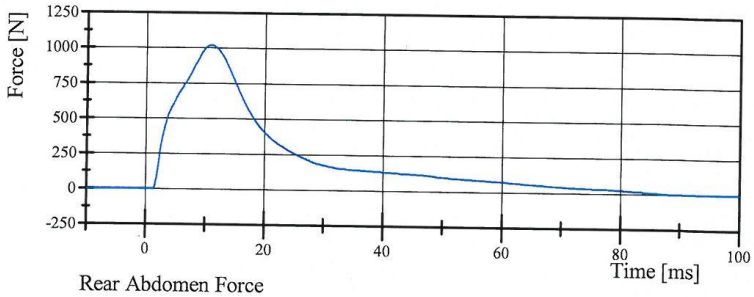
Left Lateral Abdomen
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Front Abdomen Force



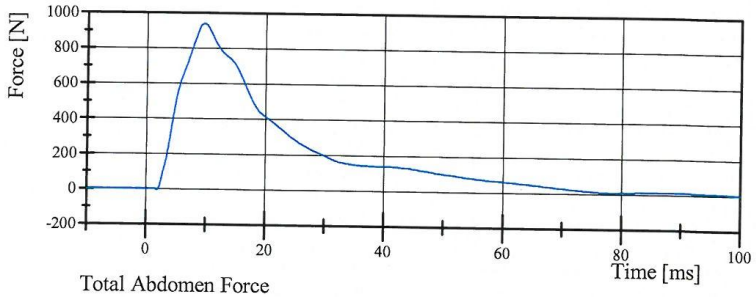
Filter Class: CFC_600
Max: 551.2 N at 11.5 ms
Min: -11.8 N at 99.2 ms

Middle Abdomen Force



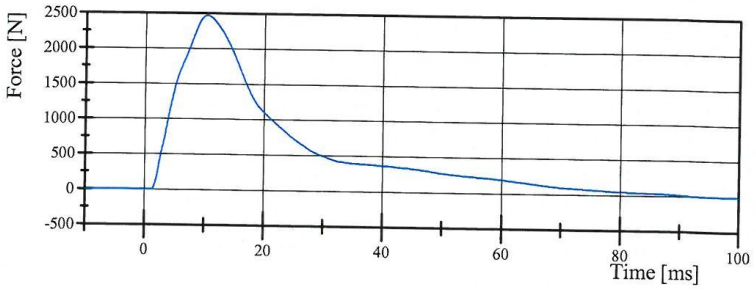
Filter Class: CFC_600
Max: 1,018.1 N at 10.9 ms
Min: -2.2 N at 1.2 ms

Rear Abdomen Force



Filter Class: CFC_600
Max: 937.4 N at 9.7 ms
Min: -6.3 N at 1.8 ms

Total Abdomen Force



Filter Class: CFC_600
Max: 2,467.1 N at 10.3 ms
Min: -11.4 N at 100.0 ms

Specification Source: NHTSA Final Rule 8/15/2008

10.17.2012 11:36:15 536

Transportation Research Center Inc.

Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	41 %	Yes
Test Probe Velocity	4.2 - 4.4 m/s	4.21 m/s	Yes
Test Probe Force			
Peak	4,700 - 5,400 N	5,022.8 N	Yes
Time of Peak	11.8 - 16.1 ms	13.68 ms	Yes
Pubic Symphysis Force			
Peak	(-1,230) - (-1,590) N	-1,339.5 N	Yes
Time of Peak	12.2 - 17.0 ms	15.20 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

Specification Source: NHTSA Final Rule 8/15/2008

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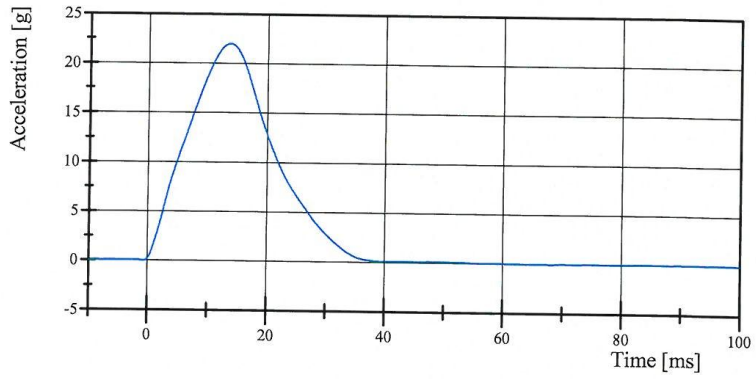
Transportation Research Center Inc.

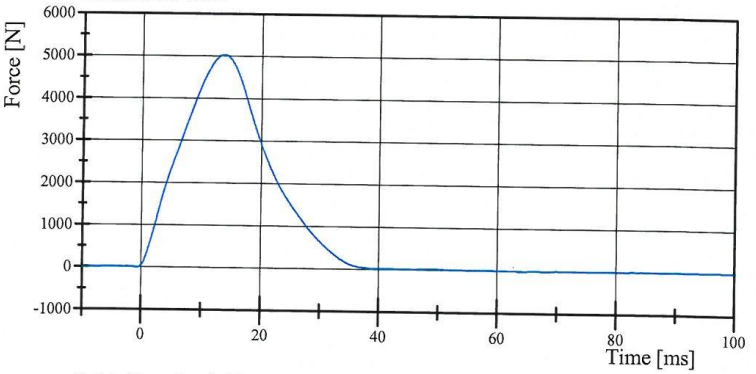
Left Lateral Pelvis
ES-2re Serial No. F030 Certification No. 9-1
Test Date: 10/17/2012

Pendulum Acceleration



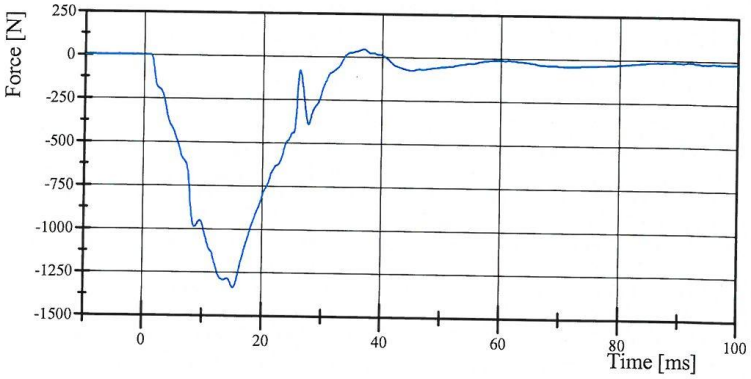
Filter Class: CFC_180
Max: 21.9 gn at 13.7 ms
Min: -0.1 gn at -0.7 ms

Pendulum Force



Filter Class: CFC_180
Max: 5,022.8 N at 13.7 ms
Min: -13.3 N at -0.7 ms

Pubic Symphysis Force



Filter Class: CFC_600
Max: 43.1 N at 36.9 ms
Min: -1,339.5 N at 15.2 ms

Specification Source: NHTSA Final Rule 8/15/2008

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Pre-Test Calibration Sheets
Passenger S/N 305

Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.013

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	134	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	543	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	401	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	314	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	866	Yes
Z	Waist Circumference	761.0 - 791.0	779	Yes

Technician

Approved

Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	118.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.7 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

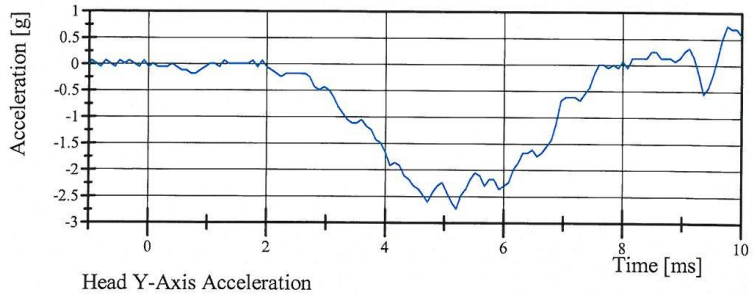
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 14:40:19 229

Transportation Research Center Inc.

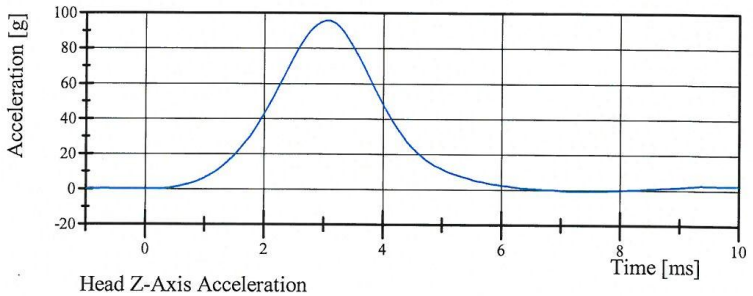
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Head X-Axis Acceleration



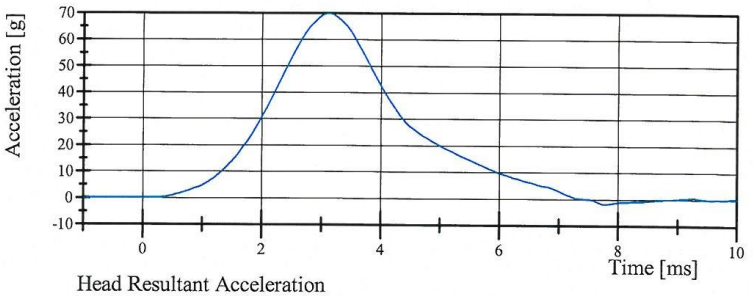
Filter Class: CFC_1000
Max: 0.7 gn at 9.8 ms
Min: -2.7 gn at 5.2 ms

Head Y-Axis Acceleration



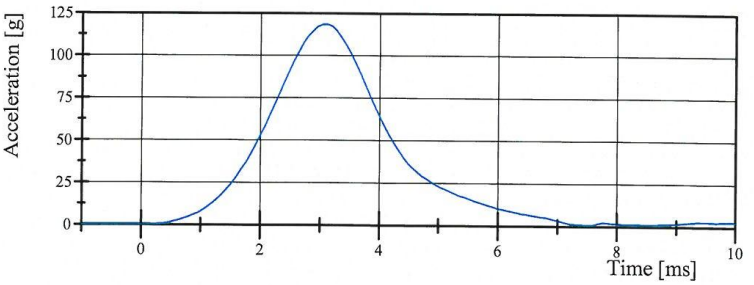
Filter Class: CFC_1000
Max: 95.8 gn at 3.0 ms
Min: -0.8 gn at 7.2 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 70.0 gn at 3.1 ms
Min: -1.9 gn at 7.8 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 118.4 gn at 3.0 ms
Min: 0.0 gn at -0.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 14:40:25 229

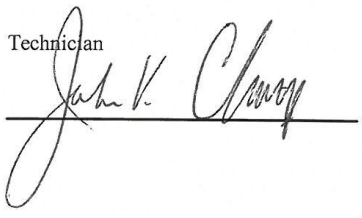
Transportation Research Center Inc.

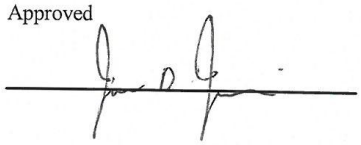
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.612 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.322 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.530 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.803 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.632 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.641 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-74.9 deg	Yes
Time of Peak	50 - 70 ms	61.7 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.8 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	119.4 ms	Yes

Test meets specifications.

Comments:

Technician 

Approved 

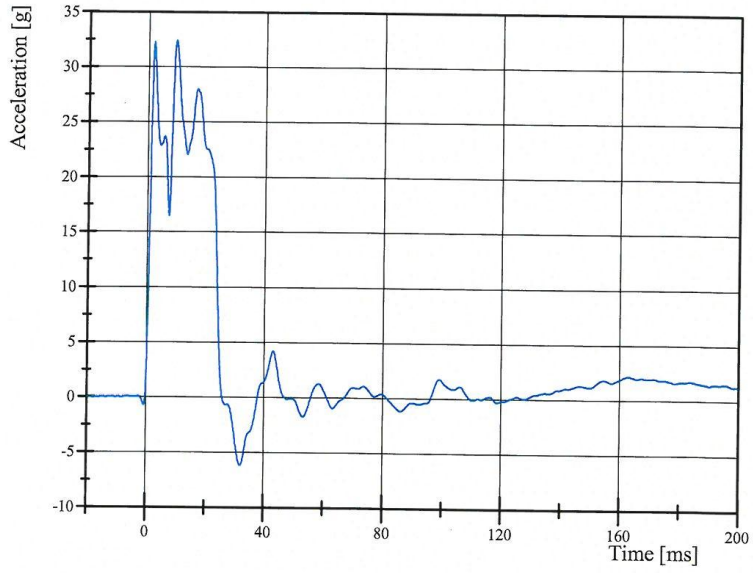
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 15:59:54 638

Transportation Research Center Inc.

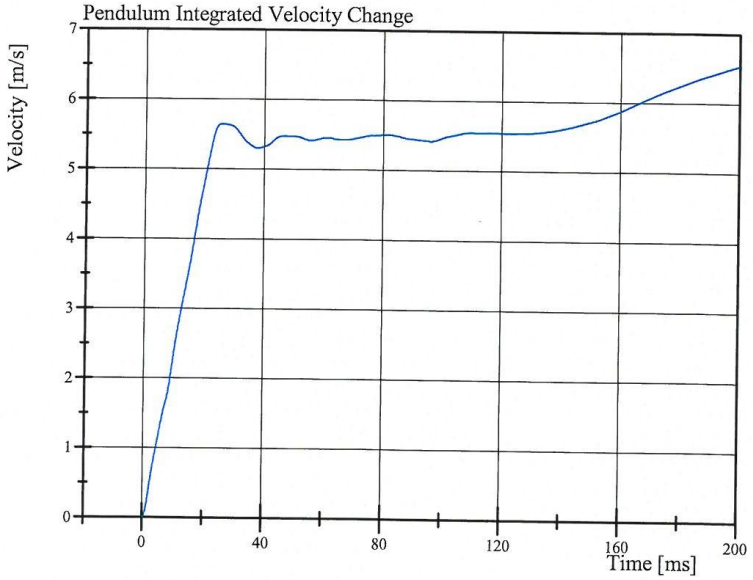
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.4 gn at 9.4 ms
Min: -6.2 gn at 32.1 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.5 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

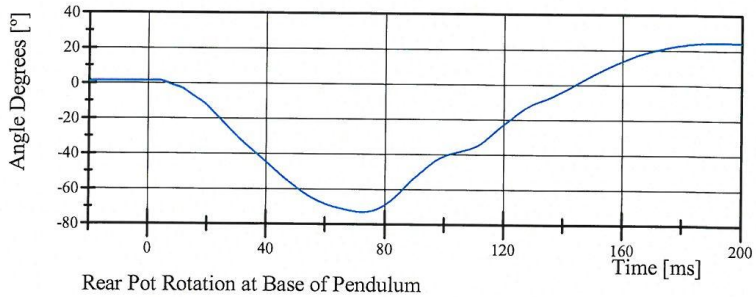
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 16:00:06 638

Transportation Research Center Inc.

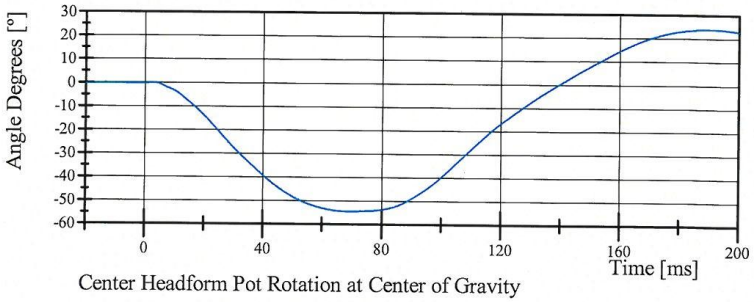
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Forward Pot Rotation at Base of Pendulum



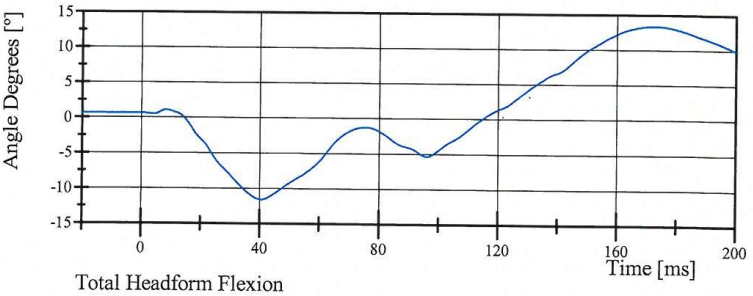
Filter Class: CFC_60
Max: 24.3 ° at 193.5 ms
Min: -73.0 ° at 72.4 ms

Rear Pot Rotation at Base of Pendulum



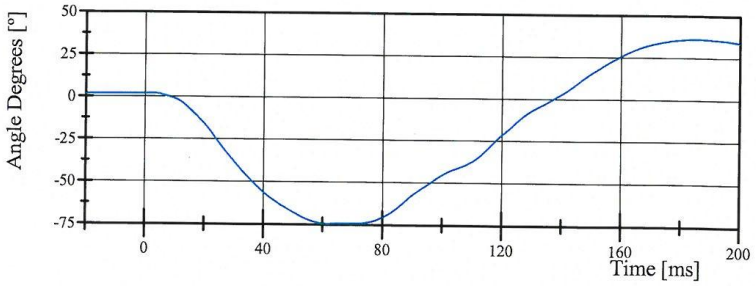
Filter Class: CFC_60
Max: 23.9 ° at 190.2 ms
Min: -54.7 ° at 69.6 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 13.3 ° at 172.2 ms
Min: -11.6 ° at 40.5 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 36.0 ° at 184.8 ms
Min: -74.9 ° at 61.7 ms

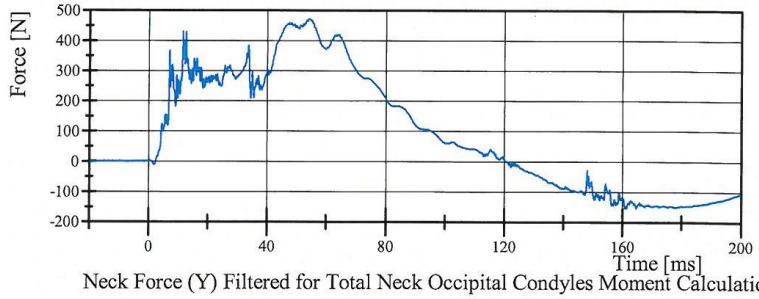
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 16:00:07 638

Transportation Research Center Inc.

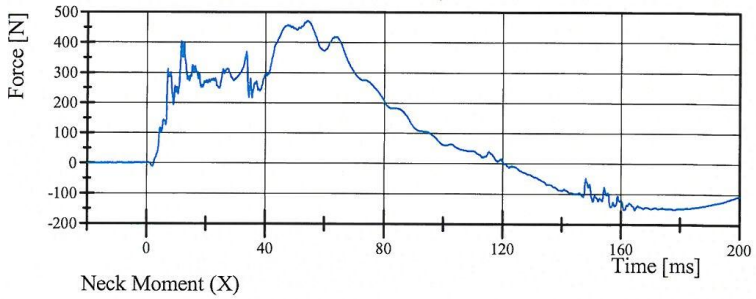
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/8/2012

Neck Force (Y)



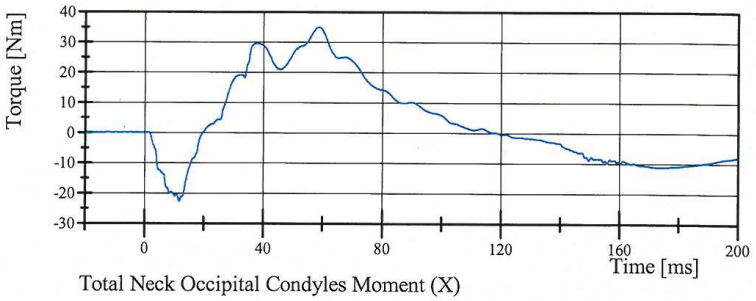
Filter Class: CFC_1000
Max: 472.1 N at 54.2 ms
Min: -154.2 N at 160.9 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



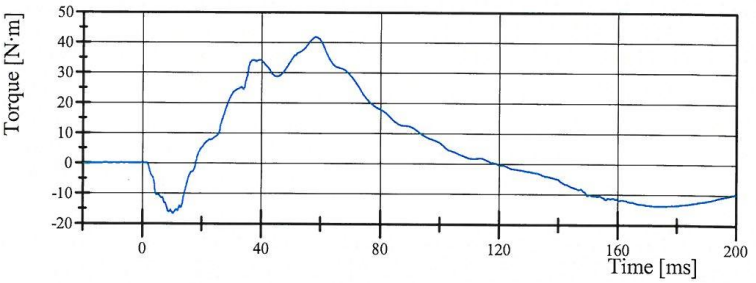
Filter Class: CFC_600
Max: 471.7 N at 54.2 ms
Min: -151.6 N at 164.7 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 35.0 Nm at 58.6 ms
Min: -22.8 Nm at 11.8 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Consta
Max: 41.8 N·m at 58.2 ms
Min: -16.7 N·m at 10.4 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.08.2012 16:00:08 638

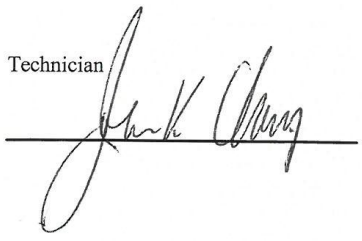
Transportation Research Center Inc.

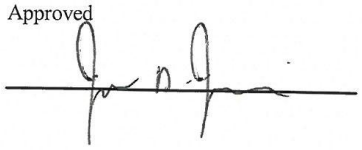
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.7 g	Yes
Shoulder Displacement	28 - 37 mm	29.5 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.8 g	Yes

Test meets specifications.

Comments:

Technician 

Approved 

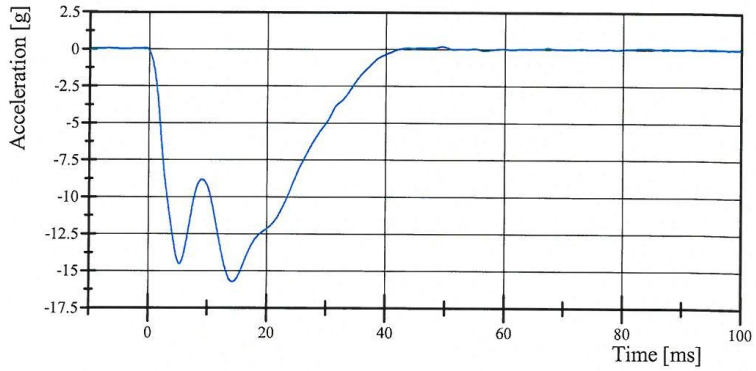
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:08:02 837

Transportation Research Center Inc.

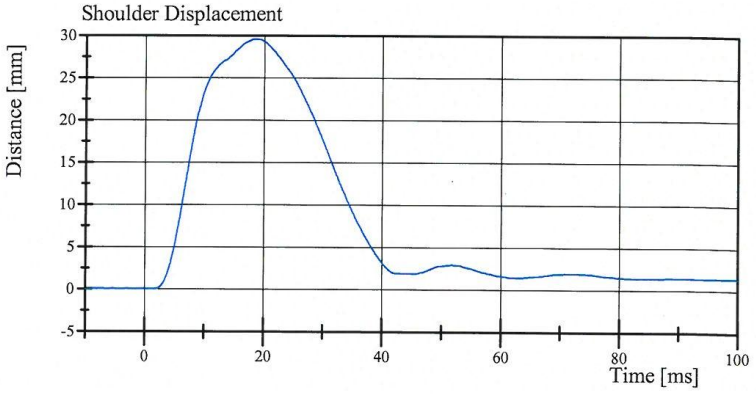
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



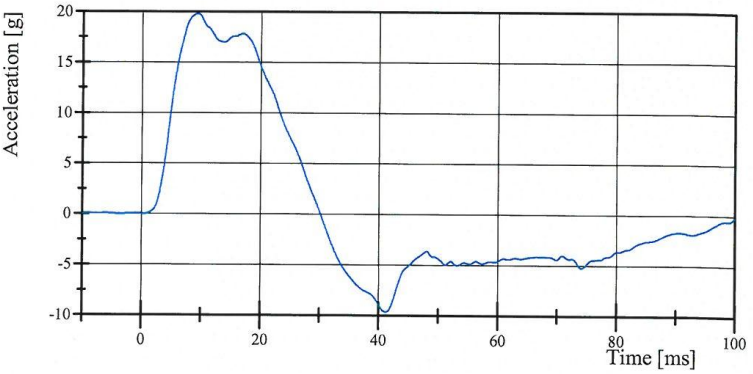
Filter Class: CFC_180
Max: 0.2 gn at 49.4 ms
Min: -15.7 gn at 14.2 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 29.5 mm at 18.4 ms
Min: -0.0 mm at 1.7 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.8 gn at 9.4 ms
Min: -9.7 gn at 41.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:08:11 837

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.775 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.4 g	Yes
Shoulder Displacement	31 - 40 mm	32.7 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	26.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	34.1 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	39.1 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	32.6 g	Yes

Test meets specifications.

Comments:

Technician

Approved

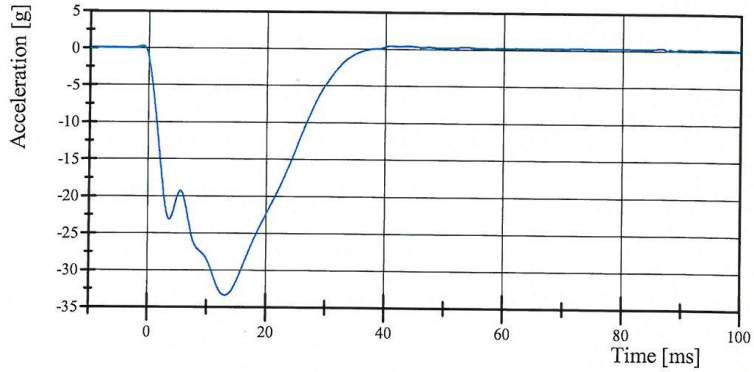
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:44:15 627

Transportation Research Center Inc.

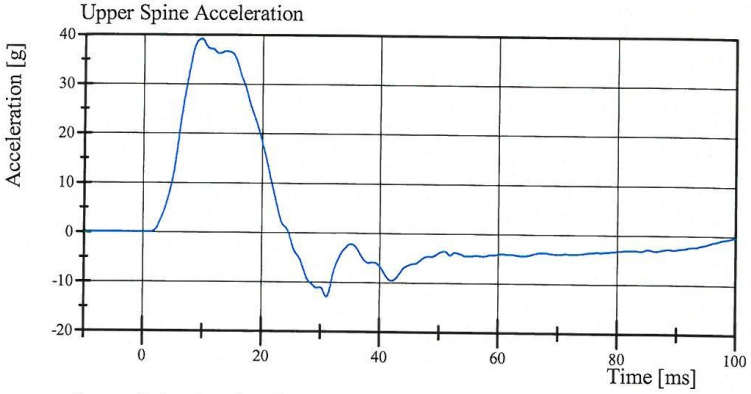
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



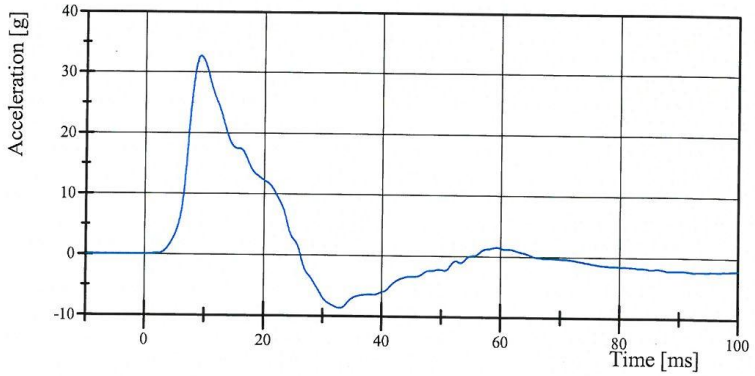
Filter Class: CFC_180
Max: 0.4 gn at 40.7 ms
Min: -33.4 gn at 13.1 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 39.1 gn at 9.6 ms
Min: -13.0 gn at 31.0 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 32.6 gn at 9.2 ms
Min: -8.7 gn at 33.0 ms

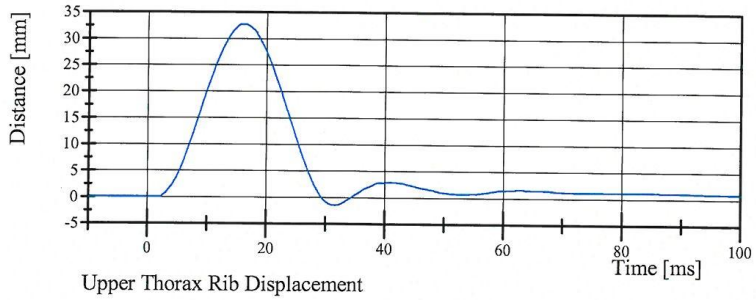
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:44:26 627

Transportation Research Center Inc.

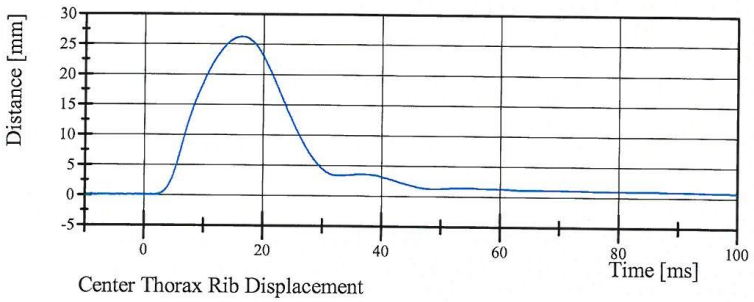
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Shoulder Rib Displacement



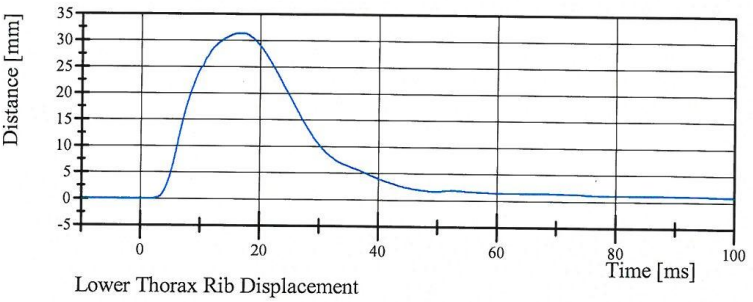
Filter Class: CFC_600
Max: 32.7 mm at 15.8 ms
Min: -1.5 mm at 31.6 ms

Upper Thorax Rib Displacement



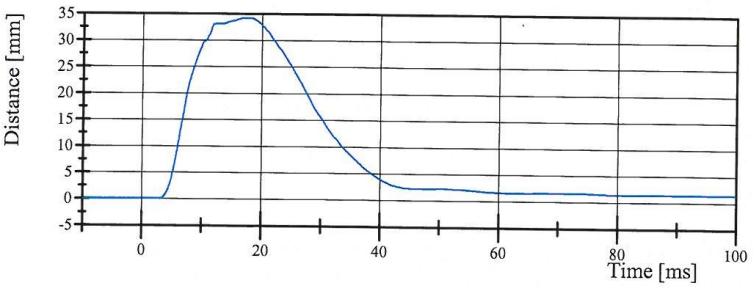
Filter Class: CFC_600
Max: 26.2 mm at 16.5 ms
Min: -0.0 mm at 1.7 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.3 mm at 16.6 ms
Min: -0.0 mm at -9.2 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 34.1 mm at 17.4 ms
Min: -0.0 mm at -3.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 09:44:27 627

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.388 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.4 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	38.0 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	36.8 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.4 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.7 g	Yes

Test meets specifications.

Comments:

Technician

Approved

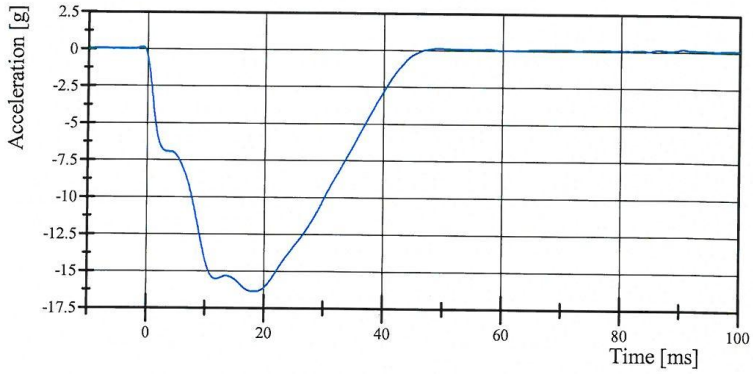
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 10:54:31 857

Transportation Research Center Inc.

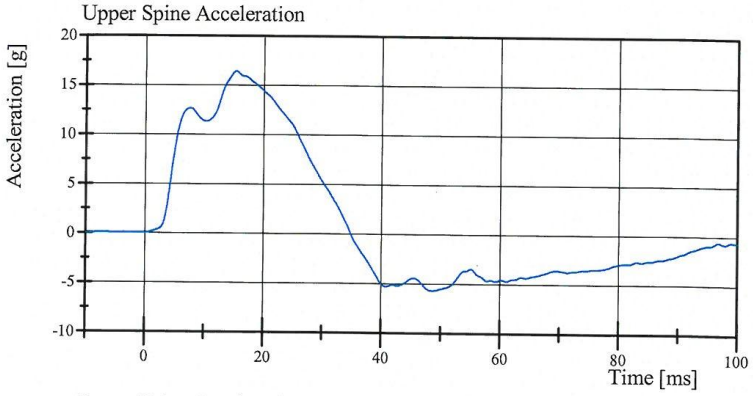
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



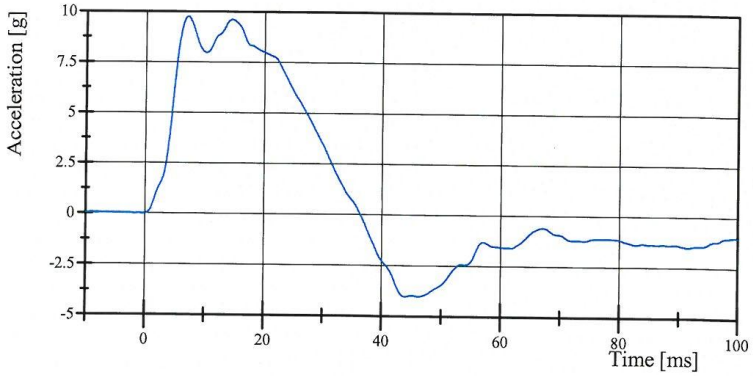
Filter Class: CFC_180
Max: 0.2 gn at 90.4 ms
Min: -16.4 gn at 18.4 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 16.4 gn at 15.3 ms
Min: -5.7 gn at 48.6 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.7 gn at 7.0 ms
Min: -4.0 gn at 43.9 ms

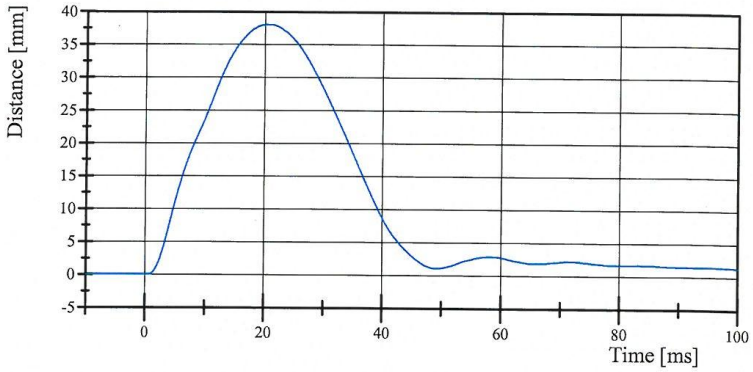
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 10:54:43 857

Transportation Research Center Inc.

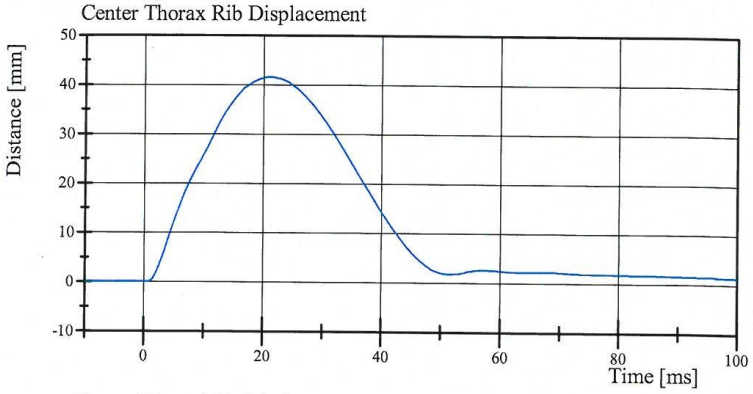
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Upper Thorax Rib Displacement



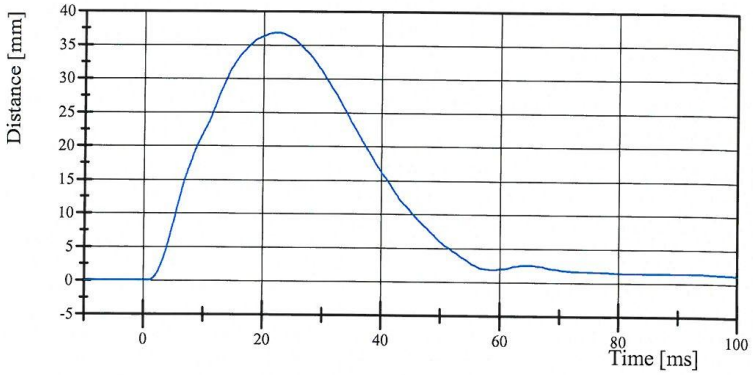
Filter Class: CFC_600
Max: 38.0 mm at 20.6 ms
Min: -0.0 mm at 0.6 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.5 mm at 21.0 ms
Min: -0.0 mm at -3.2 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 36.8 mm at 22.2 ms
Min: -0.0 mm at 0.8 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 10:54:44 857

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.9 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	41.0 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	38.5 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	12.04 g	Yes

Test meets specifications.

Comments:

Technician

Approved

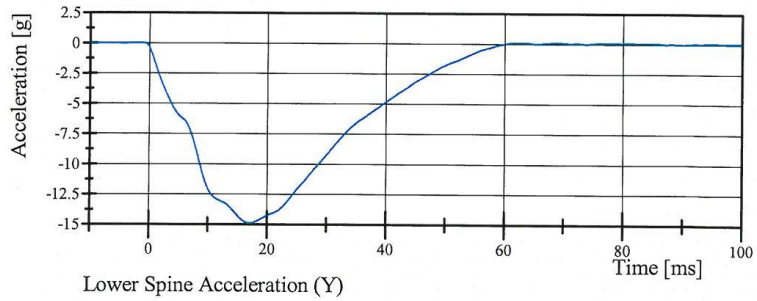
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 11:19:18 659

Transportation Research Center Inc.

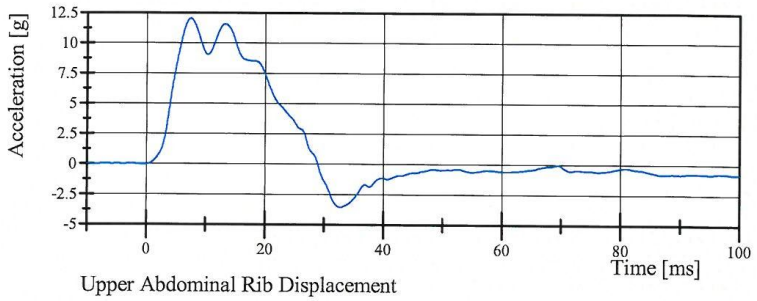
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



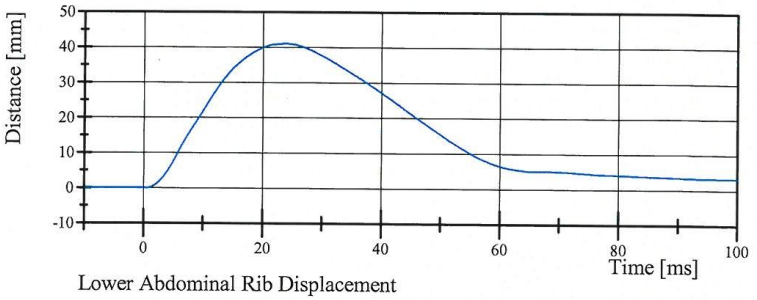
Filter Class: CFC_180
Max: 0.1 gn at 61.6 ms
Min: -14.9 gn at 17.0 ms

Lower Spine Acceleration (Y)



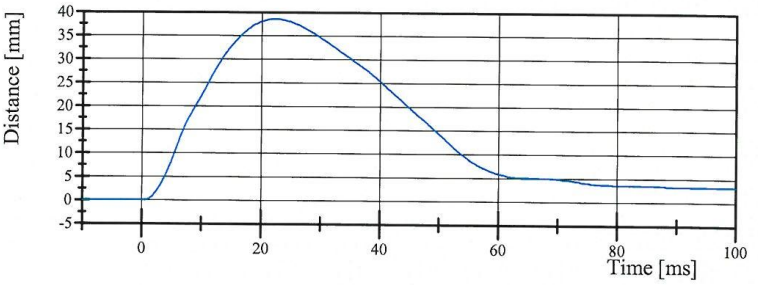
Filter Class: CFC_180
Max: 12.0 gn at 7.4 ms
Min: -3.5 gn at 32.7 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 41.0 mm at 23.8 ms
Min: -0.0 mm at -1.4 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 38.5 mm at 21.9 ms
Min: -0.0 mm at 0.5 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 11:19:29 659

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.25 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-38.4 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	29.4 g	Yes
Iliac Force	4,100 - 5,100 N	4,531.4 N	Yes

Test meets specifications.

Comments:

Technician

Approved

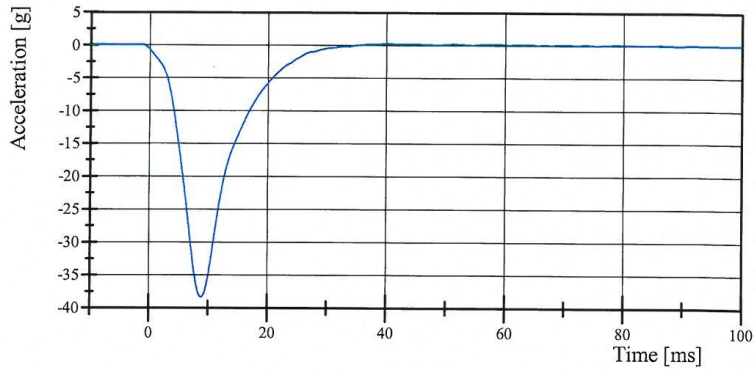
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 08:17:44 715

Transportation Research Center Inc.

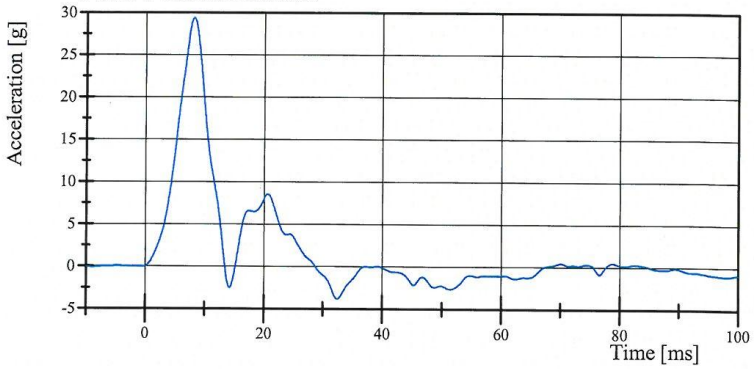
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



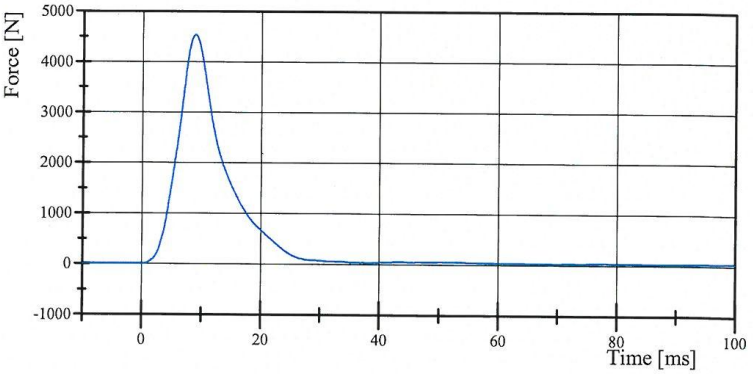
Filter Class: CFC_180
Max: 0.3 gn at 40.1 ms
Min: -38.4 gn at 8.8 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 29.4 gn at 8.1 ms
Min: -3.8 gn at 32.5 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,531.4 N at 8.9 ms
Min: -0.8 N at -2.3 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 08:17:53 715

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.69 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-41.20 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	35.4 g	Yes
Acetabulum Force	3,600 - 4,300 N	4,113.3 N	Yes

Test meets specifications.

Comments:

Technician

Approved

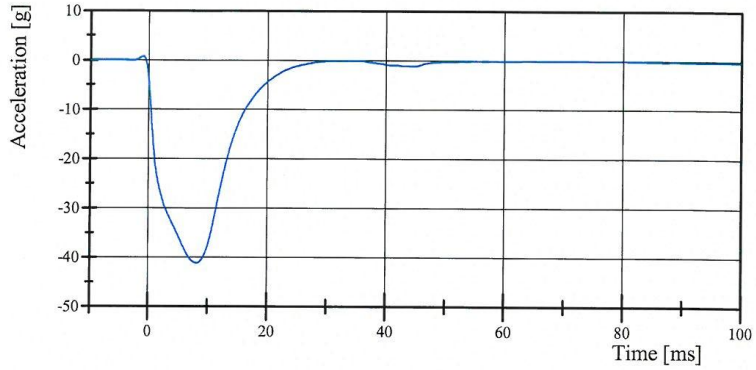
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.09.2012 11:37:27 462

Transportation Research Center Inc.

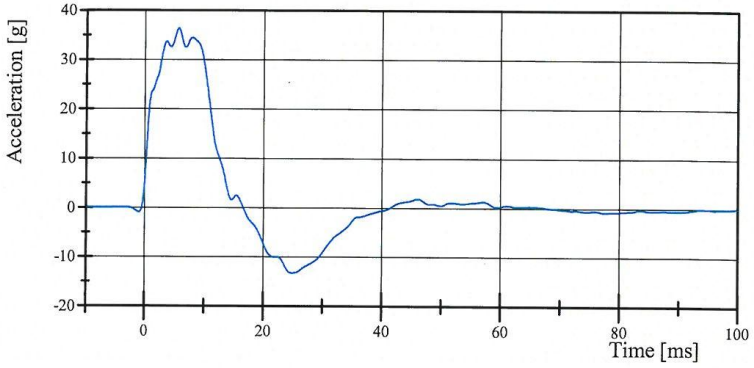
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 13-1
Test Date: 10/9/2012

Probe Acceleration



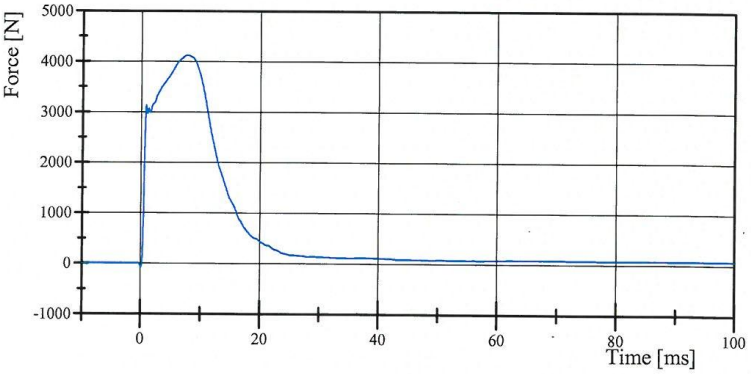
Filter Class: CFC_180
Max: 0.7 gn at -1.0 ms
Min: -41.2 gn at 8.2 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 36.3 gn at 5.6 ms
Min: -13.3 gn at 24.9 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 4,113.3 N at 7.8 ms
Min: -81.7 N at 0.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

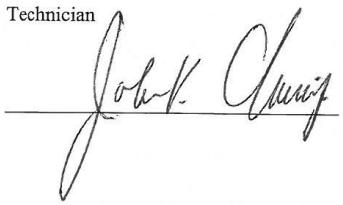
10.09.2012 11:37:38 462

Post-Test Calibration Sheets
Passenger S/N 305

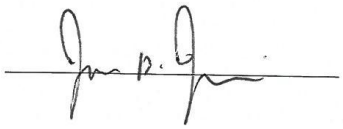
Transportation Research Center Inc.
SIDIIs Dummy - Level D
External Dimensions
Serial No. 305 Calibration No.014

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	777	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	84	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	103	Yes
F	Thigh Clearance	119.0 - 135.0	134	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	45	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	544	Yes
K	Buttock to Knee Length	514.0 - 540.0	534	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	203	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	316	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to seat Back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	84	Yes
W	Foot Width (left)	78.0 - 94.0	84	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	865	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician



Approved



Revised 9/29/2005

Transportation Research Center Inc.

Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/18/2012

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	115 - 137 g	119.7 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.5 g	Yes
Is Head Resultant Acceleration Curve Unimodal within 15% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Approved

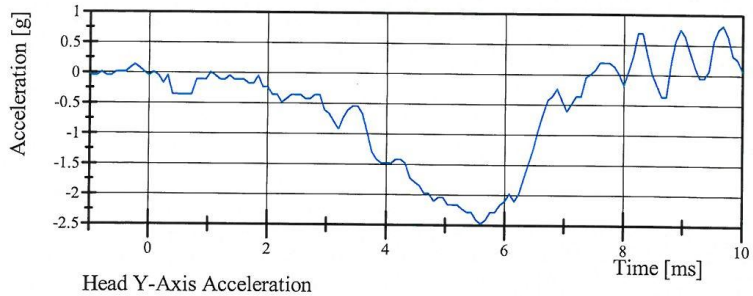
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.18.2012 14:34:38 232

Transportation Research Center Inc.

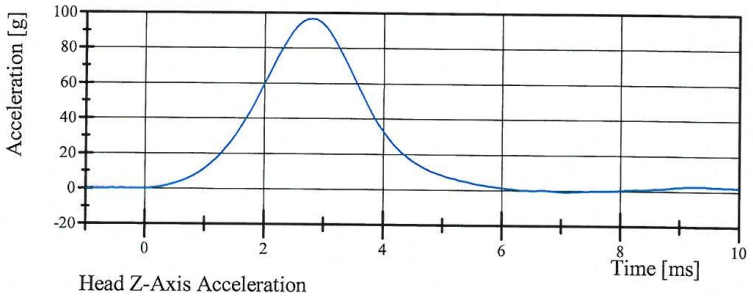
Left Lateral Head Drop
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/18/2012

Head X-Axis Acceleration



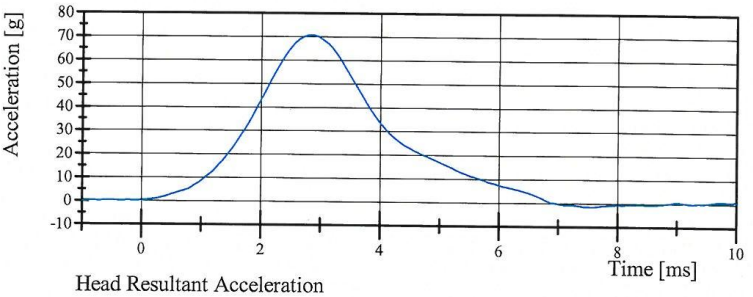
Filter Class: CFC_1000
Max: 0.8 gn at 9.7 ms
Min: -2.5 gn at 5.6 ms

Head Y-Axis Acceleration



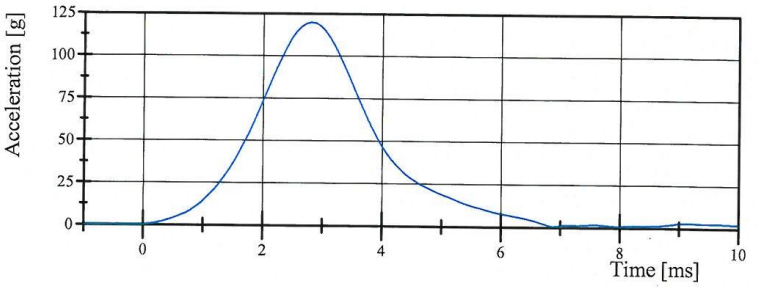
Filter Class: CFC_1000
Max: 96.7 gn at 2.8 ms
Min: -0.7 gn at 7.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 70.5 gn at 2.8 ms
Min: -1.6 gn at 7.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 119.7 gn at 2.8 ms
Min: 0.0 gn at -0.1 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.18.2012 14:34:49 232

Transportation Research Center Inc.

Left Lateral Neck
SID IIs Serial No. 305 Certification No. 14-7
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.51) - (-5.63) m/s	-5.614 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	2.20 - 2.80 m/s	2.548 m/s	Yes
Change at 15 ms	3.30 - 4.10 m/s	3.732 m/s	Yes
Change at 20 ms	4.40 - 5.40 m/s	4.978 m/s	Yes
Change at 25 ms	5.40 - 6.10 m/s	5.825 m/s	Yes
Change at 25 to 100 ms	5.50 - 6.20 m/s	5.836 m/s	Yes
Maximum Headform Flexion occurring between 50ms and 70ms.			
Peak	(-71) - (-81) deg	-71.7 deg	Yes
Time of Peak	50 - 70 ms	63.0 ms	Yes
Total Neck Occipital Condyles Moment	36 - 44 N·m	41.1 N·m	Yes
Total Neck Occipital Condyles Moment Decay Time to 0 N·m	102 - 126 ms	123.5 ms	Yes

Test meets specifications.

Comments:

Technician

Approved

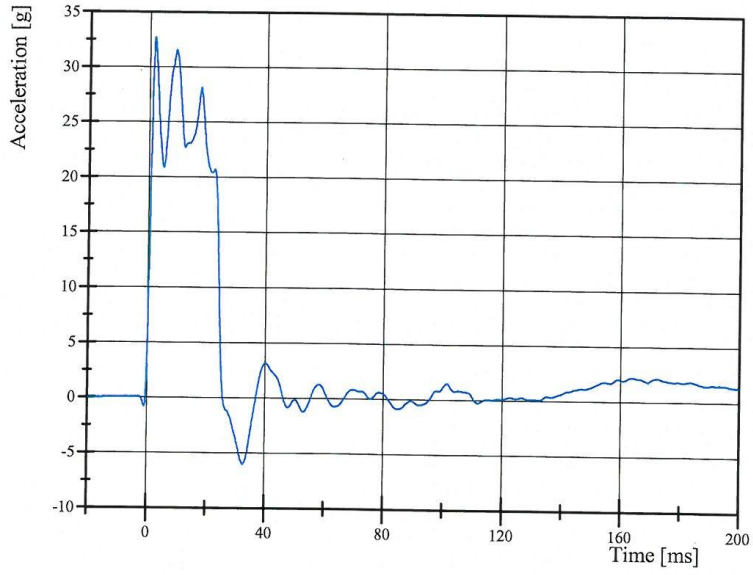
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 14:52:00 642

Transportation Research Center Inc.

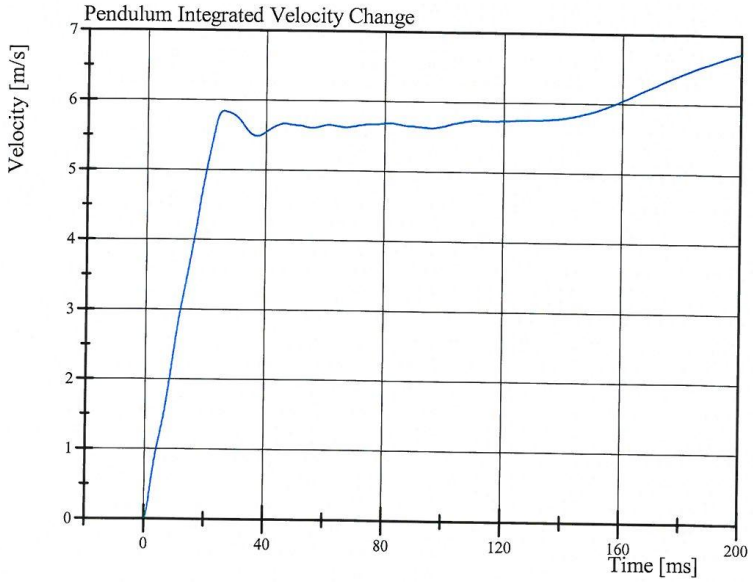
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 14-7
Test Date: 10/19/2012

Pendulum Acceleration



Filter Class: CFC_180
Max: 32.6 gn at 1.8 ms
Min: -6.0 gn at 32.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180
Max: 6.7 m/s at 200.0 ms
Min: 0.0 m/s at 0.0 ms

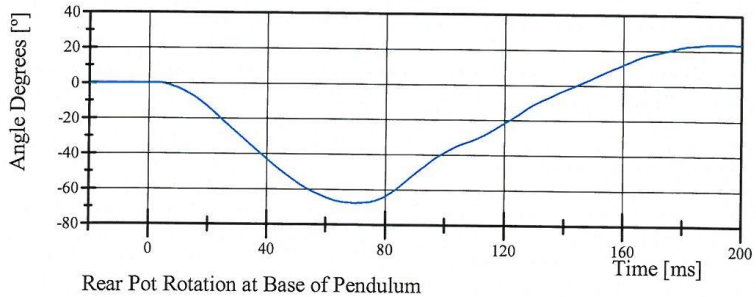
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 14:52:32 642

Transportation Research Center Inc.

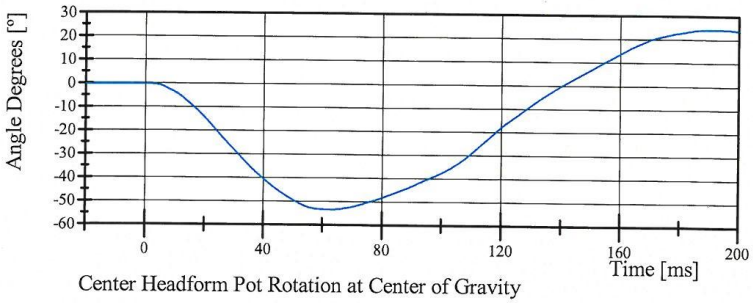
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 14-7
Test Date: 10/19/2012

Forward Pot Rotation at Base of Pendulum



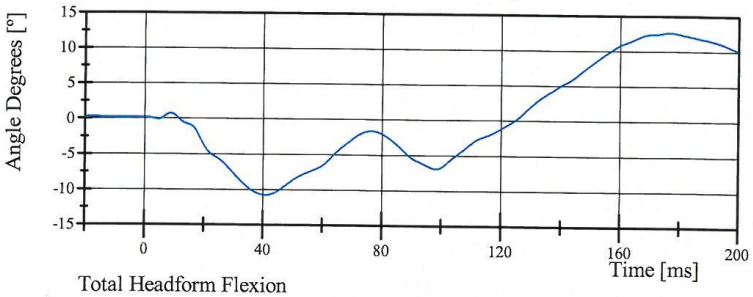
Filter Class: CFC_60
Max: 23.7 ° at 191.9 ms
Min: -67.7 ° at 69.6 ms

Rear Pot Rotation at Base of Pendulum



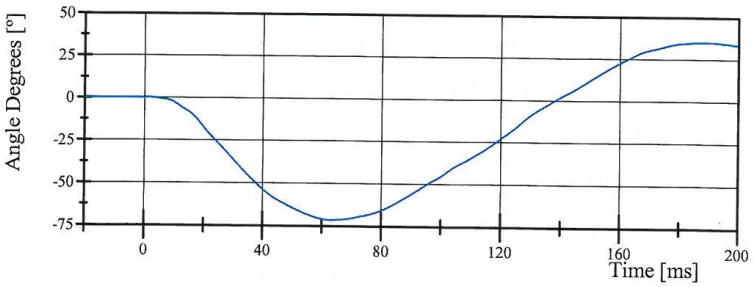
Filter Class: CFC_60
Max: 24.3 ° at 191.0 ms
Min: -53.5 ° at 62.5 ms

Center Headform Pot Rotation at Center of Gravity



Filter Class: CFC_60
Max: 12.6 ° at 176.6 ms
Min: -10.8 ° at 40.9 ms

Total Headform Flexion



Filter Class: CFC_60
Max: 35.2 ° at 189.4 ms
Min: -71.7 ° at 63.0 ms

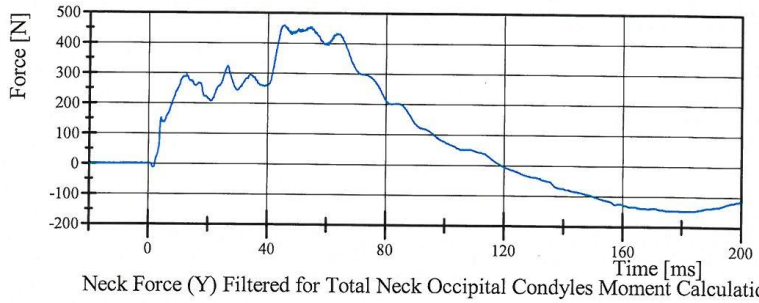
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 14:52:33 642

Transportation Research Center Inc.

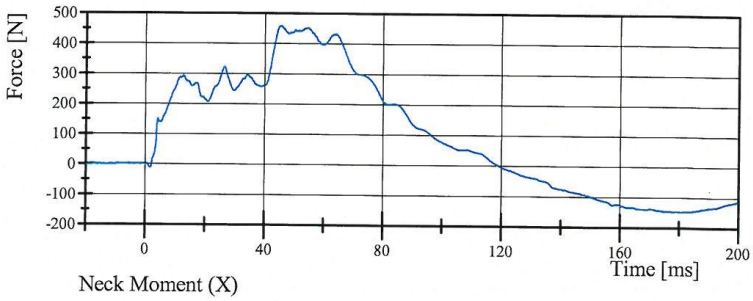
Left Lateral Neck
SID IIs Serial No. 305 Certification No. 14-7
Test Date: 10/19/2012

Neck Force (Y)



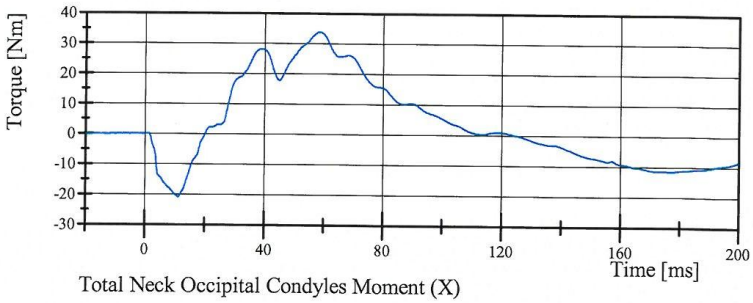
Filter Class: CFC_1000
Max: 458.8 N at 45.6 ms
Min: -149.1 N at 180.6 ms

Neck Force (Y) Filtered for Total Neck Occipital Condyles Moment Calculation



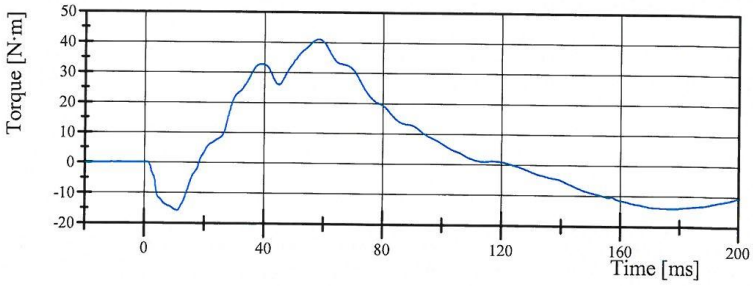
Filter Class: CFC_600
Max: 458.3 N at 45.5 ms
Min: -148.5 N at 180.6 ms

Neck Moment (X)



Filter Class: CFC_600
Max: 33.9 Nm at 58.2 ms
Min: -20.9 Nm at 11.1 ms

Total Neck Occipital Condyles Moment (X)



Filter Class: Without_(Constai
Max: 41.1 N·m at 58.1 ms
Min: -15.9 N·m at 11.0 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 14:52:33 642

Transportation Research Center Inc.

Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.33 m/s	Yes
Impactor Acceleration	(-13) - (-18) g	-15.7 g	Yes
Shoulder Displacement	28 - 37 mm	30.8 mm	Yes
Upper Spine Lateral Acceleration	17 - 22 g	19.0 g	Yes

Test meets specifications.

Comments:

Technician

Approved

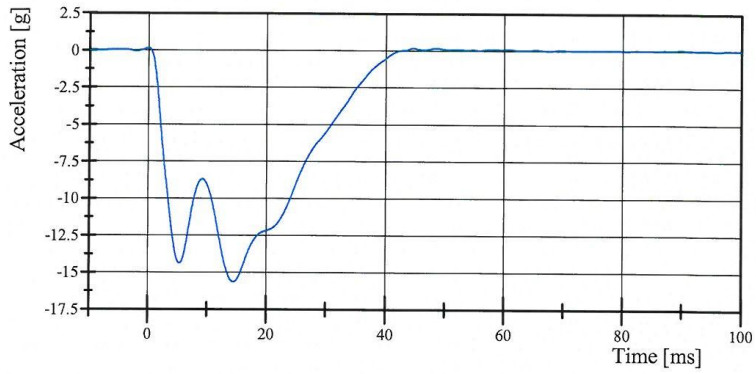
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 07:26:54 810

Transportation Research Center Inc.

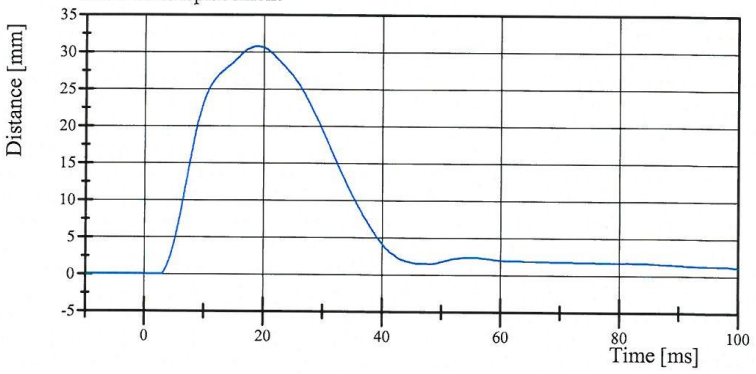
Left Lateral Shoulder
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



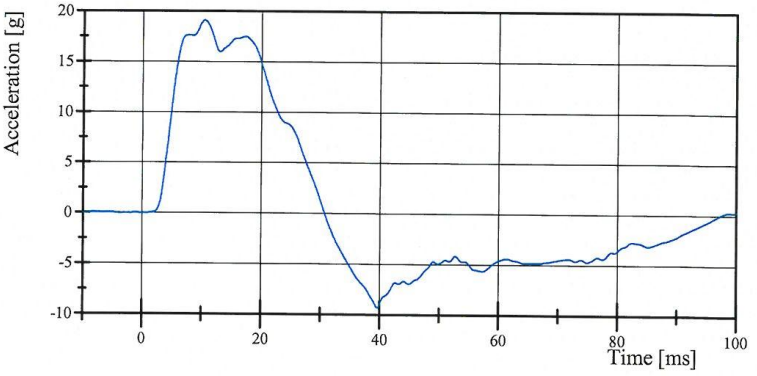
Filter Class: CFC_180
Max: 0.2 gn at 44.6 ms
Min: -15.7 gn at 14.5 ms

Shoulder Displacement



Filter Class: CFC_600
Max: 30.8 mm at 18.9 ms
Min: -0.0 mm at 2.7 ms

Upper Spine Acceleration (Y)



Filter Class: CFC_180
Max: 19.0 gn at 10.4 ms
Min: -9.3 gn at 39.7 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 07:27:15 810

Transportation Research Center Inc.

Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.800 m/s	Yes
Impactor Acceleration	(-30) - (-36) g	-33.3 g	Yes
Shoulder Displacement	31 - 40 mm	35.9 mm	Yes
Upper Thorax Rib Displacement	25 - 32 mm	27.2 mm	Yes
Center Thorax Rib Displacement	30 - 36 mm	31.3 mm	Yes
Lower Thorax Rib Displacement	32 - 38 mm	33.0 mm	Yes
Upper Spine Lateral Acceleration	34 - 43 g	38.7 g	Yes
Lower Spine Lateral Acceleration	29 - 37 g	33.9 g	Yes

Test meets specifications.

Comments:

Technician

Approved

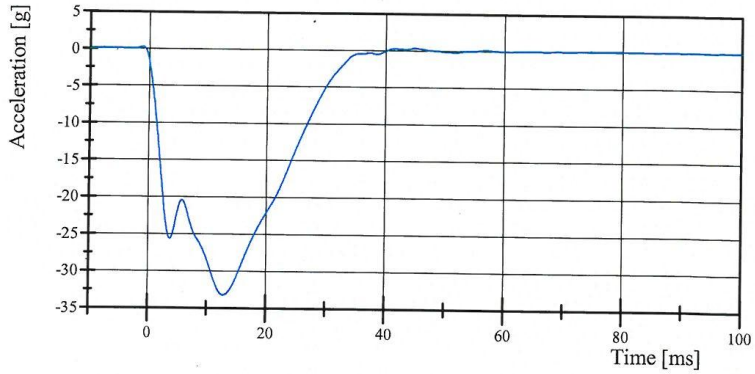
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 08:56:03 607

Transportation Research Center Inc.

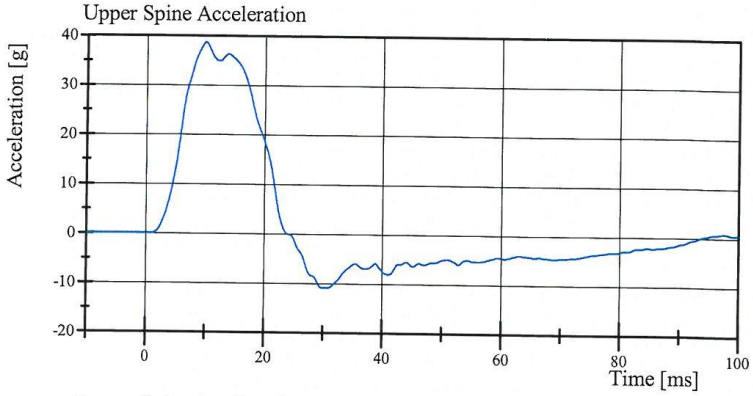
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



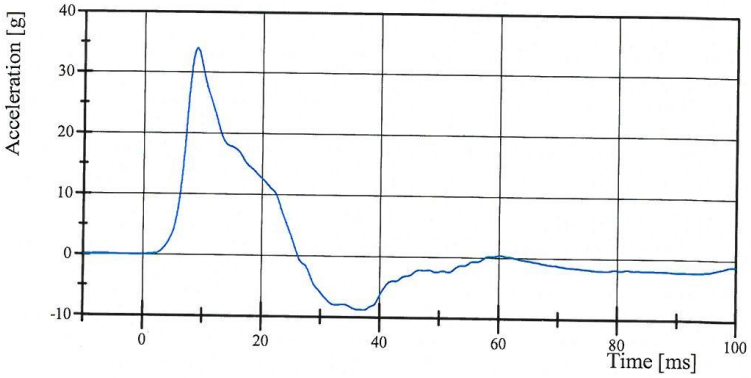
Filter Class: CFC_180
Max: 0.3 gn at 45.0 ms
Min: -33.3 gn at 12.9 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 38.7 gn at 10.0 ms
Min: -10.9 gn at 30.8 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 33.9 gn at 9.0 ms
Min: -8.9 gn at 37.3 ms

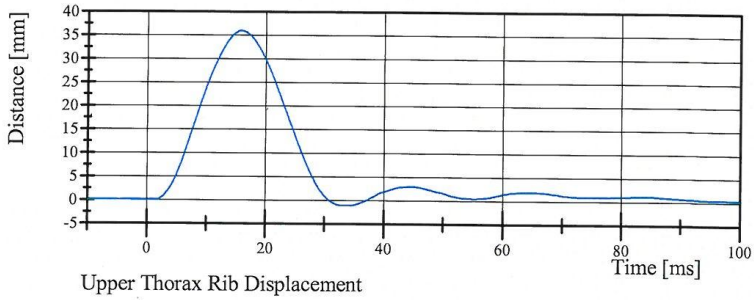
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 08:56:15 607

Transportation Research Center Inc.

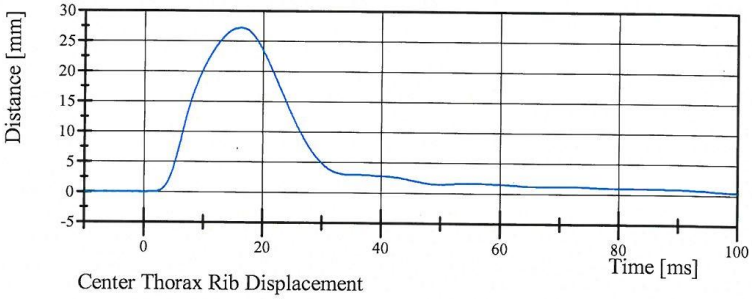
Left Lateral Thorax with Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Shoulder Rib Displacement



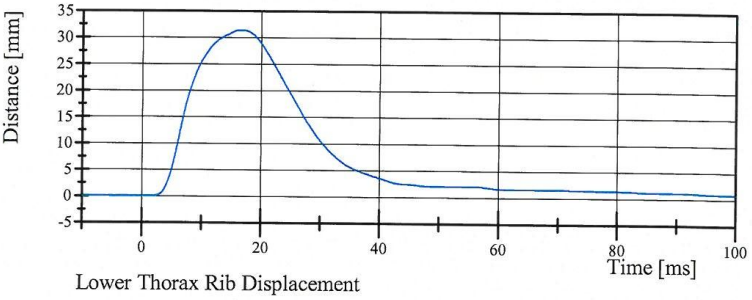
Filter Class: CFC_600
Max: 35.9 mm at 15.7 ms
Min: -1.1 mm at 33.8 ms

Upper Thorax Rib Displacement



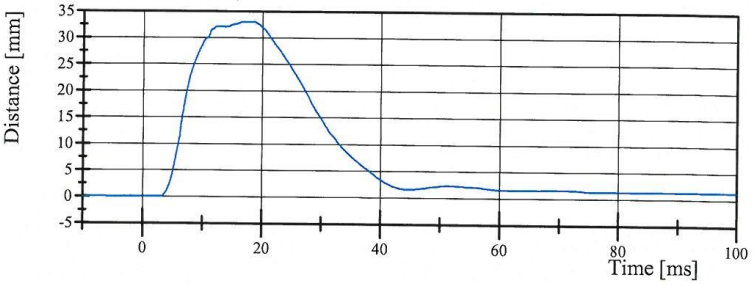
Filter Class: CFC_600
Max: 27.2 mm at 16.2 ms
Min: -0.0 mm at -1.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 31.3 mm at 16.5 ms
Min: -0.0 mm at -0.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 33.0 mm at 18.3 ms
Min: -0.0 mm at 2.9 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 08:56:16 607

Transportation Research Center Inc.

Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.391 m/s	Yes
Impactor Acceleration	(-14) - (-18) g	-16.3 g	Yes
Upper Thorax Rib Displacement	32 - 40 mm	37.1 mm	Yes
Center Thorax Rib Displacement	39 - 45 mm	41.5 mm	Yes
Lower Thorax Rib Displacement	35 - 43 mm	37.6 mm	Yes
Upper Spine Lateral Acceleration	13 - 17 g	16.1 g	Yes
Lower Spine Lateral Acceleration	7 - 11 g	9.8 g	Yes

Test meets specifications.

Comments:

Technician

Approved

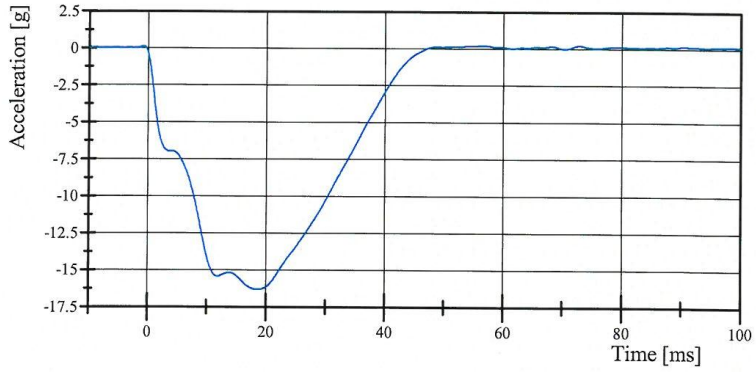
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 10:42:10 816

Transportation Research Center Inc.

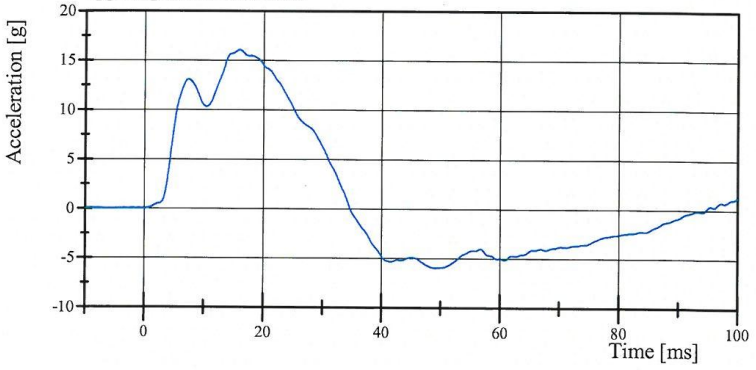
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



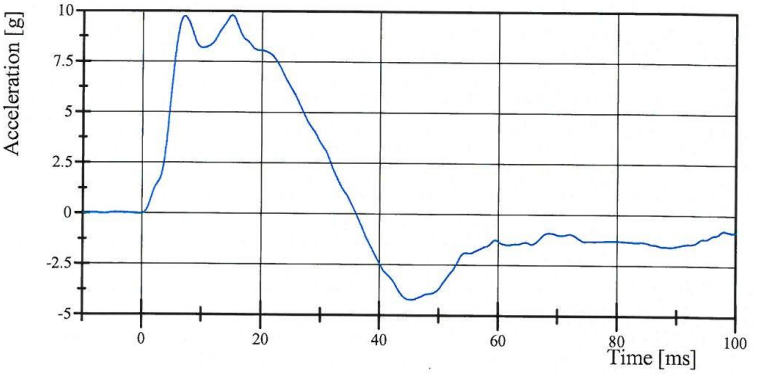
Filter Class: CFC_180
Max: 0.2 gn at 72.9 ms
Min: -16.3 gn at 18.6 ms

Upper Spine Acceleration



Filter Class: CFC_180
Max: 16.1 gn at 15.9 ms
Min: -6.0 gn at 49.1 ms

Lower Spine Acceleration



Filter Class: CFC_180
Max: 9.8 gn at 15.0 ms
Min: -4.2 gn at 45.2 ms

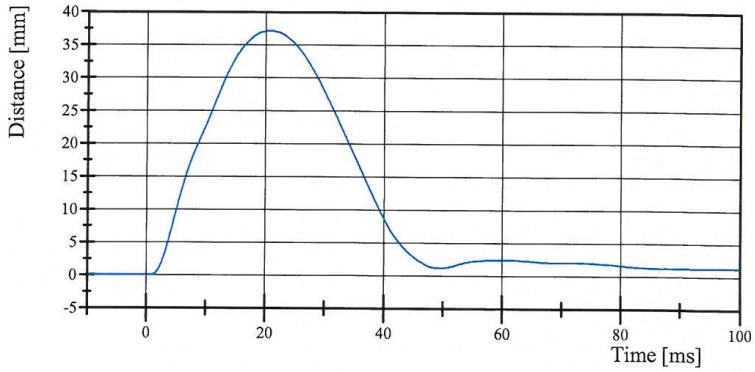
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 10:42:21 816

Transportation Research Center Inc.

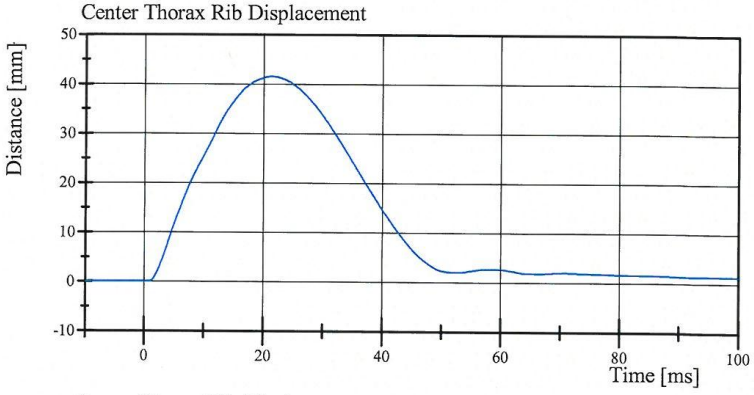
Left Lateral Thorax without Arm
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Upper Thorax Rib Displacement



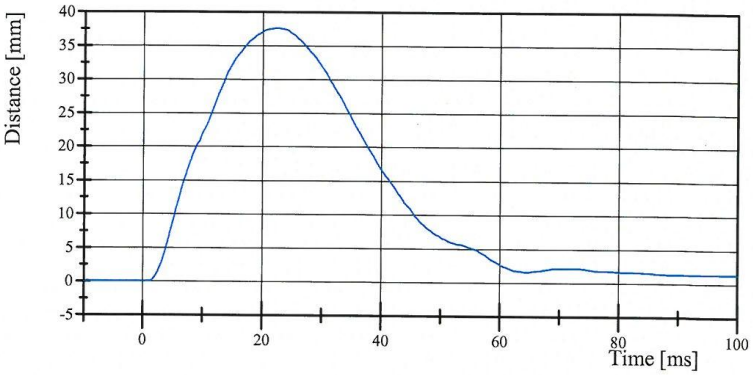
Filter Class: CFC_600
Max: 37.1 mm at 20.7 ms
Min: -0.0 mm at 0.9 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 41.5 mm at 21.4 ms
Min: -0.0 mm at -0.6 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 37.6 mm at 22.4 ms
Min: -0.0 mm at -5.4 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 10:42:22 816

Transportation Research Center Inc.

Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Acceleration	(-12) - (-16) g	-14.1 g	Yes
Upper Abdominal Rib Displacement	36 - 47 mm	40.1 mm	Yes
Lower Abdominal Rib Displacement	33 - 44 mm	39.4 mm	Yes
Lower Spine Lateral Acceleration	9 - 14.0 g	11.40 g	Yes

Test meets specifications.

Comments:

Technician

Approved

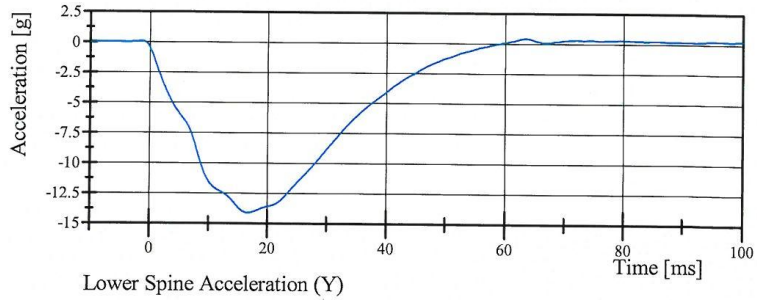
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 11:02:04 657

Transportation Research Center Inc.

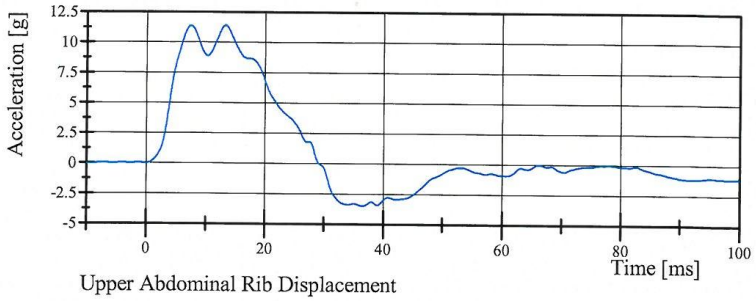
Left Lateral Abdomen
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



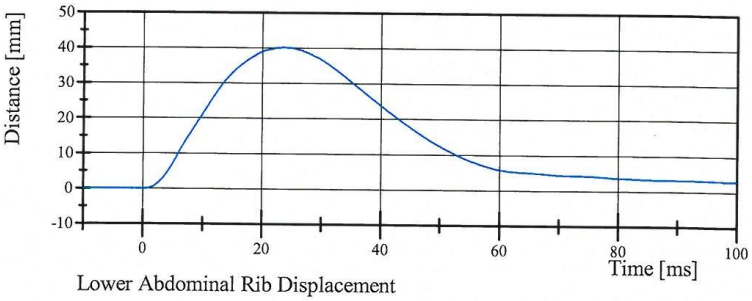
Filter Class: CFC_180
Max: 0.4 gn at 63.4 ms
Min: -14.1 gn at 16.7 ms

Lower Spine Acceleration (Y)



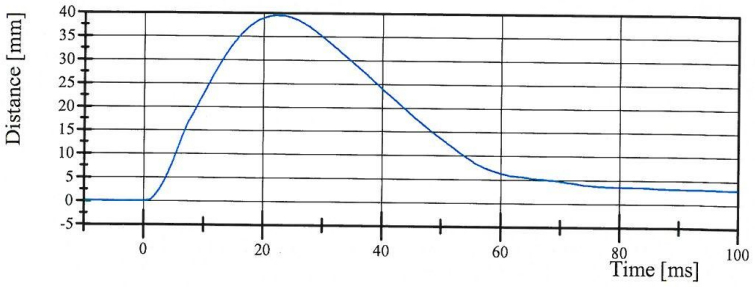
Filter Class: CFC_180
Max: 11.4 gn at 13.2 ms
Min: -3.5 gn at 36.5 ms

Upper Abdominal Rib Displacement



Filter Class: CFC_600
Max: 40.1 mm at 23.7 ms
Min: -0.0 mm at -2.6 ms

Lower Abdominal Rib Displacement



Filter Class: CFC_600
Max: 39.4 mm at 22.4 ms
Min: -0.0 mm at 0.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 11:02:13 657

Transportation Research Center Inc.

Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/18/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	6.6 - 6.8 m/s	6.68 m/s	Yes
Impactor Acceleration	(-38.0) - (-47.0) g	-42.27 g	Yes
Peak Pelvis Lateral Acceleration after 6ms	34 - 42 g	38.7 g	Yes
Acetabulum Force	3,600 - 4,300 N	3,979.2 N	Yes

Test meets specifications.

Comments:

Technician

Approved

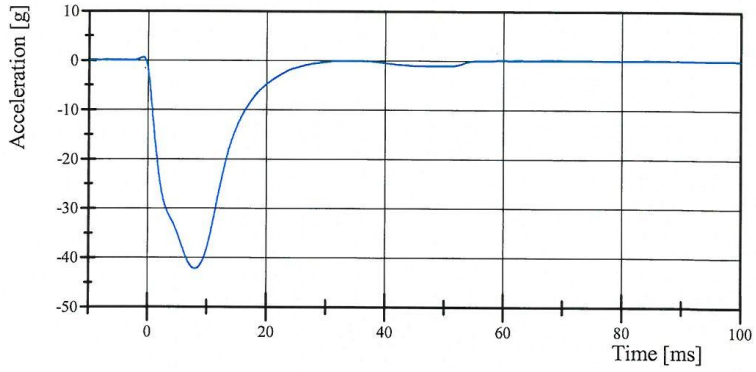
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.18.2012 16:18:30 437

Transportation Research Center Inc.

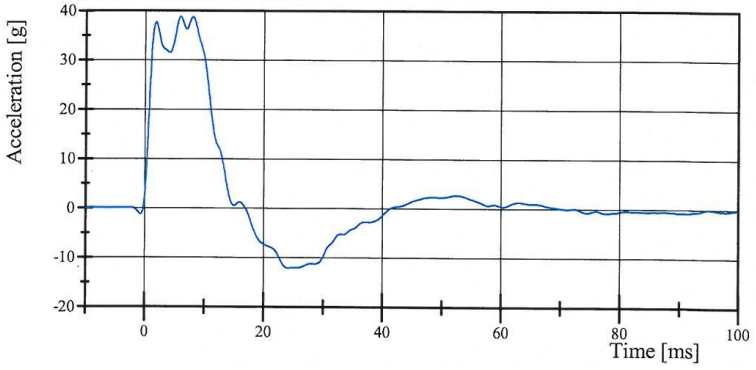
Left Lateral Pelvis
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/18/2012

Probe Acceleration



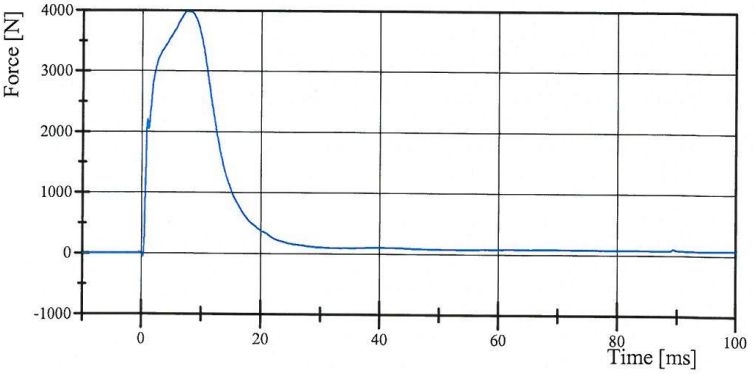
Filter Class: CFC_180
Max: 0.5 gn at -0.8 ms
Min: -42.3 gn at 8.0 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 38.7 gn at 5.9 ms
Min: -12.1 gn at 24.2 ms

Acetabulum Y-Axis Force



Filter Class: CFC_600
Max: 3,979.2 N at 7.7 ms
Min: -54.8 N at 0.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.18.2012 16:18:41 437

Transportation Research Center Inc.

Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.2 - 4.4 m/s	4.31 m/s	Yes
Impactor Acceleration	(-36) - (-45) g	-40.2 g	Yes
Peak Pelvis Lateral Acceleration	28 - 39 g	30.2 g	Yes
Iliac Force	4,100 - 5,100 N	4,770.1 N	Yes

Test meets specifications.

Comments:

Technician

Approved

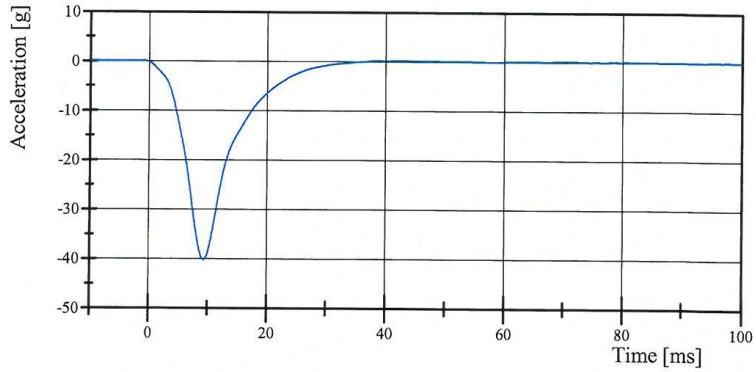
Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

10.19.2012 11:50:41 649

Transportation Research Center Inc.

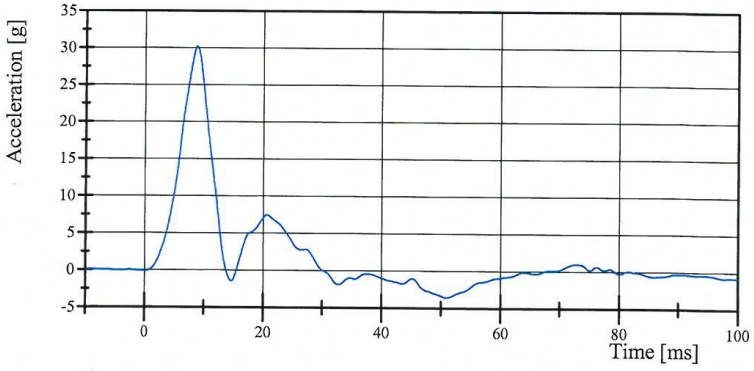
Left Lateral Iliac
SID IIs Serial No. 305 Certification No. 14-1
Test Date: 10/19/2012

Probe Acceleration



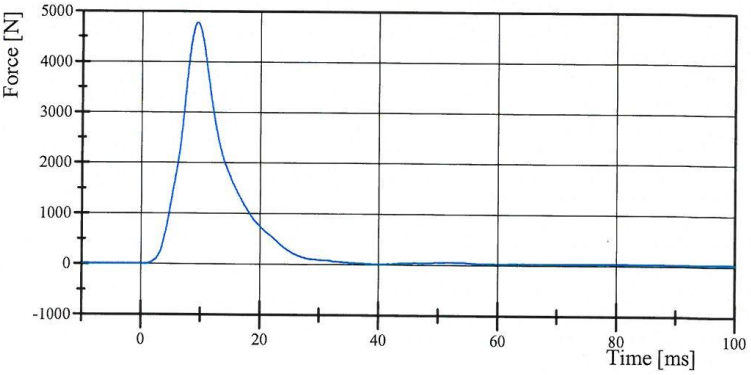
Filter Class: CFC_180
Max: 0.2 gn at 43.0 ms
Min: -40.2 gn at 9.4 ms

Pelvis Y-Axis Acceleration



Filter Class: CFC_180
Max: 30.2 gn at 8.7 ms
Min: -3.6 gn at 51.0 ms

Iliac Y-Axis Force



Filter Class: CFC_600
Max: 4,770.1 N at 9.4 ms
Min: -0.8 N at -7.2 ms

Specification Source: Procedures based on Final Rule effective 8/24/2009
Polarity in accordance with SAE J211.

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APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F030		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P58890	Endevco	28-Sep-12
		Y	P51702	Endevco	28-Sep-12
		Z	P52083	Endevco	28-Sep-12
Thoracic Rib Displacement Potentiometers	Upper	Y	175	FTSS	27-Sep-12
	Middle	Y	174	FTSS	27-Sep-12
	Lower	Y	173	FTSS	27-Sep-12
Abdomen Load Cells	Upper	Y	1441	Denton	28-Sep-12
	Middle	Y	1436	Denton	28-Sep-12
	Lower	Y	1437	Denton	28-Sep-12
Lower Spine Accelerometers (T12)		X	P73381	Endevco	28-Sep-12
		Y	P73580	Endevco	28-Sep-12
		Z	P59005	Endevco	28-Sep-11
Acetabulum Load Cell		Y	NA	NA	NA
Pubic Symphysis Load Cell		Y	457-FY	Denton	16-Nov-11

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 305		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P51719	Endevco	27-Sep-12
			Y	P51272	Endevco	27-Sep-12
			Z	P58862	Endevco	27-Sep-12
Displacement Potentiometers	Shoulder		Y	NA	NA	NA
	Thoracic Rib	Upper	Y	007	Servo	27-Sep-12
		Middle	Y	1161	Servo	27-Sep-12
		Lower	Y	1279	Servo	27-Sep-12
	Abdominal Rib	Upper	Y	1295	Servo	27-Sep-12
		Lower	Y	1136	Servo	27-Sep-12
Lower Spine Accelerometers (T12)			X	P50068	Endevco	28-Sep-12
			Y	P52051	Endevco	28-Sep-12
			Z	P51710	Endevco	28-Sep-12
Acetabulum Load Cell			Y	103-FY	FTSS	27-Sep-12
Iliac Wing Load Cell			Y	287-FY	FTSS	27-Sep-12
Pelvis Plug (struck side)				36241	FTSS	NA
Pelvis Plug (non-struck side)				NA	NA	NA

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P75525	Endevco	18-Jul-12
	Vehicle Center of Gravity	Y	P74239	Endevco	22-Aug-12
	Vehicle Center of Gravity	Z	P75110	Endevco	18-Apr-12
2	Right Sill at Front Seat	X	P74527	Endevco	24-Jul-12
	Right Sill at Front Seat	Y	P49016	Endevco	7-Aug-12
	Right Sill at Front Seat	Z	P74442	Endevco	20-Aug-12
3	Right Sill at Rear Seat	X	P76338	Endevco	8-Oct-12
	Right Sill at Rear Seat	Y	P76340	Endevco	8-Oct-12
	Right Sill at Rear Seat	Z	P76339	Endevco	8-Oct-12
4	Left Sill at Front Door	Y	P75590	Endevco	9-Oct-12
5	Left Sill at Rear Door	Y	P78140	Endevco	9-Oct-12
6	Left A-Post Lower	Y	P75754	Endevco	10-Sep-12
7	Left A-Post Middle	Y	P78134	Endevco	9-Oct-12
8	Left B-Post Lower	Y	P76393	Endevco	19-Sep-12
9	B-Post Middle	Y	P75099	Endevco	4-Sep-12
10	Front Seat Track	Y	P76448	Endevco	9-Oct-12
11	Rear Seat Track or Structure	Y	P78138	Endevco	9-Oct-12
12	Right Rear Occupant Compartment	Y	P75707	Endevco	9-Oct-12
13	Engine Block	X	P75717	Endevco	14-Sep-12
	Engine Block	Y	P76386	Endevco	14-Sep-12
14	Rear Floorpan Above Axle	X	P76449	Endevco	26-Sep-12
	Rear Floorpan Above Axle	Y	P76335	Endevco	18-Sep-12
	Rear Floorpan Above Axle	Z	P76342	Endevco	26-Sep-12

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P76076	Endevco	10-Oct-12
MDB Center of Gravity	Y	P76069	Endevco	10-Oct-12
MDB Center of Gravity	Z	P78141	Endevco	10-Oct-12
Left Frame Rail at Rear Axle Centerline	X	P75569	Endevco	10-Oct-12
Left Frame Rail at Rear Axle Centerline	Y	P75568	Endevco	10-Oct-12